[33 cont.]

136 Among the dangerous insects, the anopheles mosquito naturally comes first. It is present in enormous numbers during the [34] rainy season. In some places, small reddish-brown ticks are common. The Glossina [tsetse fly] seems to be absent; I encountered them only in the Kunene swamps. Among human parasites, bugs and fleas are practically unknown; on the other hand, lice are extraordinarily common, without being especially noticed by their owners.

9. The Water Supply

312 During the dry season, the water supply plays a decisive role. Every Bushman carries in his quiver the two reed tubes for the so-called Bushman well. It is by no means true, however, that the Bushmen are able to obtain water in this way at any time and place. It is only in places where some dampness is still visible [Fig. 1 appears here] that the earth is loosened with a digging stick, and then the reed, which, by inserting the parts into each other, may be over a meter long, is sunk into the ground. As the accompanying figure shows, the Bushman does not keep the drainage reed and the sucking reed in his mouth simultaneously. The representations which suggest this might well be completely false; instead, the Bushman has the sucking reed in the right-hand corner of his mouth, and as soon as he has his mouth full of water he lets it flow into the closed hollow of his left hand in which the drainage reed is placed. The water gained in this way is of course thoroughly mixed with saliva. It cannot be kept for any length of time.

312 824 Water reservoirs are also provided by the few baobab trees, which contain puddles of water in their interiors. An artful method is used in the Sand Veld. A palm tree is drilled halfway up its trunk; then the palm pith is scraped out as far as possible, and the opening is carefully sealed. The water rising from the roots gathers in this hollow and has a good taste.

Among the thirst-quenching roots, that of a liana (!gõa) was named in particular.

[34 cont.]

312 624 Concerning other water-containing trees, F. Seiner reports:

"The water-containing trees always have two or more trunks, and the source of the water is to be sought up where the branches fork. If the saddle formed where the branches separate shows a hole, a hollow area is traced in the adjoining part of the trunk, which may contain up to 60 liters of water. The water is obtained by tying, Bushman fashion, a small bundle of dry grass, or better still, a handkerchief, to the tip of a stick and inserting it in the hollow. When the stick is drawn out, the water drips

Fig. 1. !Kung at a Bushman Well.

from the saturated bundle or cloth, which is pressed out over a cup. [Fig. 2 appears here.]

[35] "The most important water roots are the Asclepiadacea Fockea damarana Schltr. (ehoe), the Leguminosa

[532] [224]

Fig. 2. //Gauab drives the game toward the hunters (from [113] Kühn and Obermann, Buschmannkunst [Bushman Art]).

[35 cont.]

312 Dolichos seineri Harms (eona), and the Convolvulacea Ipomoea
824 seineri Pilger (eawa); the enormous tubers of the latter two may weigh up to 150 kilograms. Considerably more important for the natives than these 'water roots' is the Curcurbitacea Citrullus naudinianus Hook. (orura of the Herero; gab of the Hottentot); without their juicy gourds, which occur in great quantities and for the most part are edible, most of the central Kalahari would be impassable during the dry season, even for the Bushmen."

Further, F. Galton (1) reports:

[113] 1. F. Galton, Tropisches Südafrika, p. 101.

312 "In practice, the first hopeful sign when people are look-
825 ing around for water is a flight of guinea fowl; next, following the habits of the land, each tree is carefully examined until a parrot is sighted, an object visible even at a great distance because the bird likes to sit on the uppermost branches. A parrot is rarely more than half an hour away from water, and the same applies to baboons. If one proceeds with careful observation and takes a probable direction, he will see doves flying about; then little birds are found in all the bushes, and they are close to it."

10. The Veldkost

222 Just as //Gauab accompanies the hunter on the chase, he is
776 also the companion of the women who go to look for veldkost. If //Gauab takes delight in a woman, he will break the bones of an animal, killing it, and will lead the woman to it. If, however, //Gauab is angry at a woman and she finds no veldkost, then she becomes angry, gets up early in the morning, abuses //Gauab, and then takes medicine and washes her face so that //Gauab will not recognize her. Then she goes into the veld and finds something.
[782] //Gauab receives no offerings from the veldkost. The celebration
222 of the first fruits of the veld described by Vedder is no longer held.
[887] The oldest woman is brought to eat samples of each type of veldkost that is brought home for the first time in the year. Then the second oldest woman takes a taste, and so on down the line.

[39 cont.]

192 sometimes radial and sometimes in rows, is called !khui. The
411 incision at the lower end of the arrow shaft is called /gei. The arrow points are usually little triangular iron plates (//khai). The entire tip, including the binding and the poisoned part, is called !hui. [Figs. 10 and 11 appear here.]

411 The arrows are 65 to 68 centimeters long. They are usu-
278 ally poisoned. The poison, which looks like dark wax, is smeared on little sticks and preserved in this way. It consists of five in-
(463) gredients, the most important of which is euphorbia sap. Only

(824)

Fig. 10. Buphane disticha Herb., Plant Used for Arrow Poison by the !Kung (Medley Wood, Natal Plants, VI, 1912).

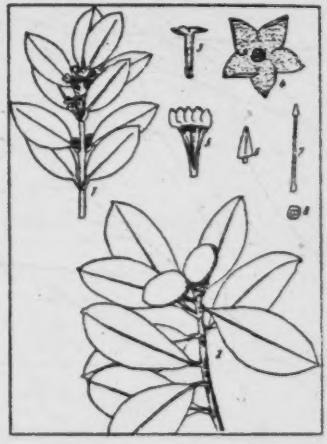


Fig. 11. Acocanthera venenata, Plant Used for Arrow Poison by the !Kung (Sim, The Forests and Forest Flora of the Colony of the Cape of Good Hope, 1907).

certain persons prepare the poison. They know that the plant poisons are not equally effective every year. Hence, a small bushbuck is shot first, then a larger animal (say, a leopard), and finally a gemsbok. Only when the proper results are obtained with all these animals is the poison traded.

411 The lances of the !Kung consist of a shaft about 160 centimeters long, which is greatly reduced in thickness toward the back end.

[47 cont.]

burn the wounded person at many places on his body. When the poison smells the warmth, it gathers at these places; incisions are then made there, and the blood is sucked out by means of a cupping glass made of gemsbok horn. The wounded person may neither sit nor lie down; he must be walked about for twenty-four hours. After this time he either dies or is cured. The method helps only in rare cases.

Snakebite is the second great danger. If one makes an incision in the lower part of the calf and rubs scrapings from a bisob root into it, the snakes smell this and do not come out of hiding. [Fig. 18 appears here.] When a person has to run great distances, bisob dust is mixed with fat and applied to the legs. In case someone is nevertheless bitten by a snake, the treatment is analogous to that used for arrow wounds. Injuries to the feet caused by thorns are very common. Injuries that pass through the aponeurosis are regarded as deadly. They practically always become infected. Even though wound infections take a less malignant and a slower course than among Europeans, they nonetheless sometimes lead to death. The only medicine used is bisob powder scattered in the wound.

Fig. 18. Kirri of the !Kung.

Some doctors claimed to be immune to snake and scorpion bites.

What Vedder observed among the Bergdama is reported in a similar manner by Schinz:

"With the intention of testing the latter characteristic, I one day persuaded an old sorcerer visiting us in Noi !as on Ngamì Lake to undertake an experiment with 12 scorpions (Buthus randus Simon) picked out by myself and having an average length of eight centimeters. In order to prevent any possibility of deception, I put the animals on the various parts of his body with tweezers, on the hands, legs, arms, mouth, and testicles. As a rule they then immediately and excitedly moved the long postabdomen back and forth and jabbed violently once or twice into the flesh of the guinea

[51 cont.]

000 out the root, but dies on the spot as a sacrifice taking the place of the person who wants the plant. Once one has it, there is no longer any danger. People take so much trouble to get it because of its following peculiarity: the demons, that is to say, evil spirits of wicked human beings who enter into the living and kill them unless help is quickly given, are driven out by this plant as soon as one so much as brings it near the patient."

751 It comes from a little bush (/gui-sa). It does not occur in
754 the Bushman region visited by me, but farther to the north. It is
824 only found accidentally. When the doctor wanders through the
756 bush, he sometimes hears low talking. Soon he sees a track resembling that of a snake and showing traces of blood. The root walks upright on this track, like a stick. He may not attack it, because he would die immediately; instead he attempts to approach from the direction in which the magic root is walking, opens the medicine bag, and lets the little mandrake walk in. Then the bag is firmly closed and at home is hung on a tall tree. The mandrake may not be taken into the hut. Something like blood drips out of the bag. Early the next morning a great fire is made; women and children and everyone assemble, each one bringing his little buck horn to obtain from the doctor some of the medicine coming from the mandrake. The medicine is rubbed on the skin. Bushmen who live among the Whites may not take this medicine because they will become sick from it. -- The medicine or the magic that is given out by the mandrake has little effect on those who were treated in the manner described above, [52] but it has considerable effect in other cases. This medicine is used to kill enemies through magic at a distance. When a doctor goes to a horde that does not yet have this medicine, he carries the horn filled with it around his neck. Some of the mandrake's magic poison passes into anyone who looks at him.

754 When the doctor sits down, anyone who has looked at him keels over and dies unless he is helped. If this person is an enemy, the doctor simply goes away and does not trouble himself any

[55 cont.]

114
171
776

time had a dependent relationship with the Bushmen, whose quite miserable imitators they had in part become. Even today Bergdama who want to become witch doctors go from Windhoek and Okombahe to the !Kung in order to learn there. If the conceptions of the Honigkaffir reported by H. Vedder were indeed ancient Negro cultural traditions, then it should surely be possible to find parallels and, at least in the names referring to the beyond, traces of the old language. Almost always among the Bantu the world of the beyond lies under the earth, whereas among the Khoisan it is in the sky. For all these reasons, I draw the conclusion that the Honigkaffir have taken over the doctrine of /Gamab from the !Kung. The expression Erob or Elotse, which is to be found among several Bushman tribes, undoubtedly goes back to Christian Hottentot influence. The two-fold names of the supreme being among various groups in Ovamboland, on the other hand, allows one to conclude that here only one new name for a well-known conception found entry, and, to be sure, with such intensity that the Hei//om, at the Etosha Pan, for example, name their most important medicinal root the Erob root. Moreover, just as among the Honigkaffir, among the Hei//om of the Etosha Pan, too, it is /Gamab who sends thunder and lightning and who kills people with shooting stars. J. Schapera recognizes that the conception of Huwe, Thora, and the mantis as creator, as the giver of rain and success in hunting, and as the protector of human beings is common to all Bushmen (ibid., p. 195) and also has its analogue among the Hottentot. He seems to regard this being as a rain god, however.

[177]

[824]

MASARWA OR OVONGGO BUSHMEN

[64 cont.]

600 769 the beyond one acts the same as on this earth. Like the Namib Bushmen, they throw little stones on the graves and at the same time pray that the spirit of the deceased may bring them luck (Dornan, op. cit., p. 146).

787 [774] Conceptions concerning dreams are tied in with the Lulu doctrine of conscience. In a dream the other self speaks with the dreamer, and this may be good or bad. The other self may be influenced by enemies and thus do harm to the twin soul.

According to Dornan, the Bantu adopted the oracle sticks from the Bushmen. Every Masarwa carries four or five pieces with him. The female pieces are longer and narrower than the [825] male pieces. They are made from the hoofs of small mammals, [824] from wildebeest bones, and fruit kernels. The names of the four sticks are: Chowe, Kao, Daua, Gaichwe. The Masarwa believe [776] that [65] Thora and Huwe, and perhaps also Khauma, speak through these bones, and Mackenzie (1) states that the Bushmen

[113] 1. Ten Years North of the Orange River, p. 136.

had designated these bones as morimo aa'me (things of God).

The shoulderblade of the springbok is also used for divination by the Masarwa.

606 551 602 Among the Masarwa the mother-in-law may not look at her son-in-law and may not mention his name. The wife may say neither the name of her husband nor the names of his relatives.

Finally, concerning the Swamp Bushmen of the Okovonggo

105 101 delta, J. Seiner reports:

"The Tannekwe have summer and winter villages, as well as boats and goats, and engage in agriculture, fishing, and hunting. [563] The latter occupations are practiced by the pure Bushmen, whereas half-breeds and the pure Mambukuschu, who were stolen as children and reared by the Bushmen, occupy themselves with agriculture and subordinate tasks.

"The number of racially pure Bushmen among the Tannekwe [144] may be as high as 60 per cent, but as a result of the slight increase of true Bushmen, which they try to equalize by stealing the Mambukuschu children, they are undergoing a steady decrease, AND RACIAL MIXTURE IS PROGRESSING RAPIDLY.

/253 cont./

224 the large bullfrog, whose bass voice resounds in all the puddles during the rainy season.[1] The flesh of the frog is boiled with the
252 skin and bones, pounded to a paste in wooden vessels, and then eaten. Among the insects, grasshoppers and termites are used for
222 food. Both are roasted. In the brief time that they are winged, the termites are lured in such great numbers to a fire maintained for the purpose of catching them that it is an easy matter for the Bushman to collect a rich booty in a few hours. A special delicacy in the Bushman household is wild honey, which, as I was able to ascertain, is extremely tasty /254/ and is to be found in quantity on the Omuramba omatako as well as in the Kaukau Veld.

825 The bullfrog is called ntchei by the Bushmen (Herero: otjisume), the termite, /ui (Herero: othohumboli).

The vegetable diet naturally changes with the seasons and is
262 quite varied. I shall attempt to give a brief survey, though at
824 the same time I am aware that it can lay no claim to completeness.

1. The chamá or taba (Herero: omatanga). These are the roasted kernels of the Kaffir pumpkin [melon?], widely known here, which produce quite a tasty dish.

2. The //ǔni (Herero: omarunga); this is the Heikum Bushman name for the palm tree that is common in this region. The edible parts of the tree are the apple-sized fruit, whose skin has a sweetish taste reminiscent of St. John's bread, and the soft interior of the trunk. The latter is a whitish, soft, fibrous pulp, which the Bush-
[252] men prepare by cooking and pounding.

3. A species of white mushroom called naũ by the Bushmen, majova by the Herero. The mushroom grows during the rainy season especially along the edges of termite hills; the diameter of its cap reaches about 20 centimeters. It is eaten raw as well as
[252] boiled. I do not know whether it is true that excessive eating of this mushroom has a detrimental effect on mental activity, as the Herero aver – ejova, plural majova, is the Herero word for stupid.

4. The unki, a well-known species of onion, about the size of a hazel nut, called //au by the Bushmen, is very common and forms an important part of the kitchen provisions, not only among the Bushmen, but also among the Herero.

[252] 5. The //guitcha of the Bushmen, ussessenga of the Herero,

/254 cont./

262 is a tuberous fruit, eaten roasted, whose taste is reminiscent of
824 potatoes.
[252]

6. A similar tuberous fruit is the ondubi of the Herero; the plant has rose-colored blossoms and long lanceolate leaves.

7. The árugu (Herero: omakungu), a type of cucumber. The plant is a climber whose fruits resemble our cucumbers; they reach the length of a finger and, when they ripen, become bright
[252] red in color. They are roasted in ashes and eaten warm.

8. The //ániba (Herero: maramba), a small bush with a bean-like fruit, similar in appearance and taste to our broad beans.

9. The sng of the Kung Bushmen; this is a large climber with double-lobate leaves whose mighty root is greatly prized by the Bushmen as a water tuber. The fruit is the size of a walnut and consists of two cotyledons enclosed by a rind which in its fresh state is soft and becomes very hard when dry. Between the fruit and the rind there is a small quantity of a whitish, slimy fluid which keeps the interior of the rind /255/ lubricated. After re-
[252] moval of the rind, the fruit is dried and roasted and then has the taste of the groundnut which is so common in East Africa. Its use has a distinctly laxative effect.

10. Like the Herero, the Bushmen are acquainted with other water tubers. The Herero word chue designates a smaller root with a very high water content, which has the shape and size of our beet.

11. The /a fruit of the Kung people is a nut slightly larger than the walnut, whose kernel, in a hard shell, tastes like our hazelnut. The hard inner shell is enclosed by a softer outer shell
[252] which has a distinctively sweet taste and which the Bushmen boil to a sauce which in appearance and taste is distinctly reminiscent of applesauce.

291 There is not much to be said about the clothing of the Heikum. The men content themselves in most cases with a leather loincloth which is fastened in the back and front to a belt tied around the waist.

The women wear the same kind of leather cloth of slightly greater length around their loins and tie a second hide from one shoulder to the opposite hip.

As the spellings of the Bushman names on my herbarium specimens are from field notes, they are often different from the spellings given in this paper, which was done after I had had the opportunity of consulting the authors I have mentioned. It will be noticed that many of the plants do not have the full set of Bushman names. The main reason is that we were not in contact with the Eastern !khū speakers until we had passed Ghanzi, and lost contact successively with the |gikwe, ||ganakwe and !h3: speakers as the expedition drew to a close. Other reasons are that my field notes were sometimes inadequate, that I forgot to ask, and that some plants appeared restricted to certain areas and were not known to all the groups of Bushmen.

As the expedition was during the winter when most of the plants were in poor condition, very little photography was done in the field. Most of the photographs are from plants which were sent back to Pretoria and cultivated there, or from plants which grow naturally in the Transvaal. In this paper the plants and photographs are arranged according to de Dalla Torre and Harms (1900-1907). Specimen numbers are in brackets.

There is little doubt that the plants discussed here represent only a fraction of those used, for we covered a very small part of the area over which the Bushmen range, and this when probably most of the annuals were dead, when some foods were out of season and when the above ground parts of many bulbous and tuberous plants had withered and disappeared so that the plants themselves could not be found.

Because of poor yield, poor quality, difficulty in harvesting or lack of flavour, not many of the Bushman food plants would be worth cultivating in their present form for the use of civilised people, but they offer a large field to the plant breeder. The most promising have been noted accordingly in the text.

There were few bones around the Bushman encampments, but this does not necessarily mean that there is a scarcity of meat in their diet, for the bones might have been removed by porcupines (Alexander, 1956; Dart, 1957) or eaten by hyaenas. A more reliable indication was the scantiness of the Bushmen's skin coverings. There are sharp frosts in the Kalahari and sometimes bitter winds, and one may argue that the Bushmen would provide themselves with sufficient skins if they had a regular supply of meat, although admittedly they eat skins after charring them on the coals and pounding them in a mortar. Vegetable refuse from former meals and fresh vegetable food, however, were found at all the Bushman encampments, and additional gatherings were the permanent chore of the women and children and of the men to a lesser degree. The insanitary condition of the surroundings also provided unmistakable evidence that the bulk of their food was of vegetable origin.

Their knowledge of field botany was astonishingly good. It has to be, otherwise they would have no chance of survival in their arid country. Fragments of stem, dead leaves, and other small clues of this nature, after being unerringly identified, were all the Bushmen needed to find many of the storage organs they were seeking. Differences which escaped me would enable them to distinguish between edible and harmful plants, and they had a thorough knowledge of the areas and habitats in which their food plants grew. They must have an influence on the distribution of plants,

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

be eaten after boiling, "pulp, rind and all". Dinter (1912:21-22) says also that the Bushmen use the heart of the palm as a green vegetable, and that a sweet sap may be tapped from the upper part of the stem and fermented to make an alcoholic drink. He gives the yield of fruits from one palm as between 20 and 50 kilograms (48 to 120 lb.). His reference to the heart of the palm is obscure, but Chapman (1868:1:55-56), who is more explicit, says that this is the core of the young trunk.

262 114 [273]

137X

Aloe rubrolutea Schinz (5135).

Eastern !khũ Bushman n‖ɔru

This species was in full bloom in early August, and made a striking show with its spikes of brick-red flowers. The plants formed rosettes of leaves 12 inches across, producing a slender erect five-foot flowering stalk. Among the hundreds of speciments seen there were none arborescent, although elsewhere arborescent forms are common (Reynolds 1950: 328). Those seen at Nama Pan were similar in habit to *Aloe zebrina*.

Aloe rubrolutea was seen only on the rocky outcrops near Nama Pan and Gam, growing in patches of an acre or so, but it has a wide distribution extending from South West Africa through the Bechuanaland Protectorate to the northern Transvaal and Portuguese East Africa.

The flowers are stripped off the flowering stalk and pounded to make a spinach-like vegetable. Although the Bushmen said that they did not eat the leaves, they were tasted raw and boiled and were found to be juicy and not unpleasant, and to have no harmful effects. They would be a good source of water in an emergency.

252 262

137Y

Aloe zebrina Bak. (4995).

!h5: Bushman.....	!ganja
‖ganakwe Bushman	n‖ɔru
ǂgikwe Bushman...	n‖uru
Naron Bushman...	n‖ɔru

The plant forms a rosette of rigid dark green leaves which have pale transverse bands and numerous sharp teeth along the margins. It may have a stem 30 centimetres long (Reynolds, 1950: 282), but those seen on the expedition were stemless. The flowering stalks were three or four feet high. The sap in the epidermis of the leaves is greenish-yellow. It oozes out of the vessels fairly quickly if a leaf is cut across, and hardens and changes colour on exposure to the air, becoming brown and glassy. The bulk of the sap, which is in the inner part of the leaf, is colourless and translucent, and does not ooze out if the leaf is cut.

Only one small clump of this Aloe was seen, on deep sand about 80 miles directly south-east of Ghanzi. It is, however, recorded from Angola and South West Africa and across the continent to the east.

The Bushmen stated that the leaves were a good source of water. One of these plants was sent to Pretoria and grew well in cultivation. On being tested, the leaves proved extremely unpleasant, not because of any bad taste but because their sap is in the form of a thick, revolting slime. Boiling or roasting did nothing towards making them more palatable. Either the Bushmen were confusing this Aloe with another species, or it

262 312 824

262 271 824 [114] is eaten only when they are in the greatest need. Reynolds (1950: 285), quoting W. B. Hooker, states that its flowers may be eaten after boiling, but I did not think of asking the Bushmen about this, and they did not volunteer any information.

X137 *Dipcadi* sp. (5163, 5307).

!h3: Bushman.....	n!ɬom
Naron Bushman.....	n!om
Eastern !khū Bushman	n!umʃé:

Although the above-ground parts had been killed by frost, enough remained for the plant to be identified as a species of Dipcadi. The bulbs were two inches below the surface of the soil, in appearance like a small onion. They were planted in Pretoria, but although they were still alive two years after being collected, they had failed to produce leaves or flowers up to the time this report was written.

Specimens were collected at Nama Pan, in parkland on sandy soil. As the plant was recognised and named by one of the southern !h3: Bushmen who was with us, it probably extends into the Kalahari well south of Ghanzi.

[262] The bulbs are edible after cooking.

Scilla sp. near *Scilla lancifolia* Bak. (5190) Photograph 5.

Eastern !khū Bushman tū

This plant has a rounded two-inch bulb covered with a thick layer of dark brown papery scales. In the summer it produces three or four spreading leaves, usually six inches long but up to 10, and one and a half inches wide at the widest part. They are thin but fleshy, strap-shaped (but in section widely V-shaped near the base), and light green, sometimes faintly mottled with darker green. The inflorescence is four inches long and the flowers small and not conspicuous, with purple stamens and a recurved perianth.

It was common in shallow sand overlying rock near Gautscha Pan and Nama Pan but was not easy to find because the leaves and inflorescences had been frosted, and blown away by the wind by the time the expedition had reached those parts. A number of bulbs collected there produced leaves and flowers in Pretoria the following summer, and it was from these plants that the notes were made.

[252 262] The bulb is edible after roasting but I have not tried it personally.

It would be dangerous to experiment with plants like this if what the Bushmen say is true, for it could be easily confused with another species which has an inedible bulb. The inedible species (No. 5181) is shown in photograph 6 and may be distinguished by its longer bulb and longer leaves (10 inches long and over, and two inches wide at the widest part). They have a translucent fringed margin, are pointed, narrowly V-shaped in section and more numerous, about 12 to a plant. In addition, the

older leaves are marked at the base on the lower surface with narrow wavy black bands. Specimens were collected in sandy soil in open parkland near Nama Pan and flowered in Pretoria the following summer. The leaves and inflorescences, like those of the edible species, die back during the winter. 137x

Neither of the two species could be named in the National Herbarium, for the genus is not well documented and badly in need of revision.

Sansevieria scabrifolia Dinter (4951) Photograph 7.

!h5: Bushman.....	ǂa-ji
ǁganakwe Bushman...	!gwi:
ǀgikwe Bushman.....	!gwi:
Naron Bushman.....	!gwi:
Eastern !khû Bushman	!hwi:

A stemless plant with bunches of stiff, erect, strap-like leaves 10 inches long and a little less than an inch wide, concave on the front or upper surface and rounded on the back, and without a midrib. They rise at intervals of a foot or so, and in tufts of up to a dozen, from a brown-skinned horizontal rhizome three inches below the ground, and are light green mottled with dark green. They are tough and fibrous rather than succulent, which is the term that has been used to describe the leaves of closely allied species. The plants may occur singly but are more often massed in communities 20 to 50 yards across. Those sent to Pretoria for growing have never thrived and never flowered, nor were they seen flowering in the field, but it is known that the inflorescence is spike-like along a 12-inch flowering stalk, and that it consists of crowded usually off-white flowers half an inch across. Flowering seems to occur rather rarely and sporadically in the genus as a whole.

This species was widespread and fairly frequent north and south of Ghanzi. It was not found in the open grassland but always among trees and scrub, though not necessarily shaded by them.

The rhizome is a useful source of water. It has a crisp, white fibrous flesh which is juicy and, although slightly bitter, not unpleasant. There are several species of Sansevieria growing in cultivation in Pretoria all alike in habit, and all have been tested. There is no perceptible difference in the taste or juiciness of any of them. 312 824

The leaf fibres of the plant described are used by the Bushmen in making a string of surprisingly good quality. 283 824

Wallera nutans Kirk (5311) Photograph 8.

Eastern !khû Bushman ʧû

The plants are about six inches high, with a slender erect central stem bearing paired light green grass-like leaves, strongly keeled and somewhat fleshy and faintly crystalline on the surface. Both the stem and the keel of the leaves are sparsely covered with short soft spines. Three or four strongly scented nodding flowers are borne, superficially very like potato flowers. There is a firm round storage organ a few inches below the surface of the ground, slightly larger than a golf ball and the colour of a new potato. 137x

It is recorded from South West Africa, the Bechuanaland Protectorate, the Transvaal, Portuguese East Africa and Natal. On the expedition it was not seen north of the Ghanzi area but near Ghanzi and to the south it was widely scattered, and sometimes fairly common in small patches. 137

The fruits are edible, and the remarks on the fruits of *Ximenia caffra* apply to the fruits of this species also. Ripe fruits were found at Ghanzi in July, although fruiting is usually over by then. [824]

Ximenia caffra Sond. (4949) Photograph 12.

!h3: Bushman..... n≠ ?uri
‖ganakwe Bushman... n≠ ?uri
gikwe Bushman..... ≠ɔ̃ri
Naron Bushman..... n≠ ?uri

A stout or straggly evergreen bush or small tree, usually about six feet high, with soft brittle branches and knobby rough twigs which are densely leafy and sometimes end in a sharp spine. There are often spines in the axils of the leaves as well. The leaves are dark green and tend to curve backwards slightly, and they and the young twigs are softly hairy. The flowers appear in early summer. They are massed along the twigs and have four recurved green petals with conspicuous white hairs on the inside. The fruit is the size of a plum, and an attractive light red.

It probably occurs in Angola, for it has been recorded from northern South West Africa near the Angola border. It is also known from Northern and Southern Rhodesia, the Bechuanaland Protectorate, the Transvaal, Portuguese East Africa and Natal. Like the other species of *Ximenia*, it was not seen along the route of the expedition north of the Ghanzi area.

The fruit is edible. It has a bitter skin and a large stone, and a reddish pulp between them, pleasantly flavoured but astringent and sour, and particularly sour next to the stone. It is at its best when over-ripe, for it does not become soft and unpleasant as many fruits do, but dries out slightly, becoming wrinkled in the process and more mellow, with the flavour of a prune. The stone is rich in oil, but this is said to be very pungent (Marloth, 1913-1932: 1: 165) and to contain a rubbery substance (Schweikerdt, 1937: 179-182). The Bushmen use it to anoint themselves but do not consider it edible. It has been tested in England for possible commercial uses, but it was decided that the oil was not worth extracting. [302 824]

Hydnora sp. (5162) Photograph 13.

Eastern !khũ Bushman ‖hɔk ?am

This curious plant is parasitic on the roots of *Combretum hereroense*. It is almost completely subterranean and is without chlorophyll. There is very little of the plant until it produces its flowers and fruits, which are much larger than the vegetative parts. The fruits are buried a few inches deep and are the size and shape of a pomegranate, but have a dark roughened woody shell split by many fine irregular cracks. The inner skin which shows through is red until the fruit ripens, when it becomes white. If the fruit is cut open a large, slightly sticky mass of pin-head brownish seeds is exposed, embedded in a pasty matrix which fills the inside of the fruit but is separate from the shell. Flowering was over by the time the first specimens were seen, but it is known that the flowers of this genus have a smell of carrion and that they protrude above the ground, where they can be reached by the insects necessary to bring about their fertilisation. They have no petals or sepals in the usual sense, their

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

X137 place being taken by a few thick fleshy erect lobes, and from the woody remnants of old flowers in this particular species it could be seen that they had four lobes. The two species recorded from South West Africa are *Hydnora africana* and *Hydnora solmsiana*, parasitic respectively on species of Euphorbia and species of Acacia. Number 5162 is either a new species, or one of the known ones parasitic on a hitherto unrecorded host. The material collected was inadequate for specific determination, and the seeds which were planted did not germinate.

This Hydnora was seen only in the immediate neighbourhood of Nama Pan, where it appeared to be fairly frequent.

The host plant is a straggly shrub up to six feet high, with grayish woolly leaves an inch long. It has the characteristic four-winged fruits of the genus, and many remain on the twigs through the winter. It was not seen in the country to the south of Ghanzi, but was common from Ghanzi northwards, and is widely distributed in Portuguese East Africa, the Transvaal and Rhodesia. A glossy-leafed form of it is also known, but was not seen along the route of the expedition.

[262] The whole mass inside the Hydnora fruit is edible. It is astringent and slightly sweet, and is eaten raw. The fruits would be difficult to find if it were not that they are eaten by various animals. A litter of [222 half-eaten fruits and fragments of rind and shallow burrowings often 824] show where the fruits have been excavated, and where more may be expected. They ripen about the end of August.

Talinum arnotii Hook. f. (5256) Photograph 14.

Eastern !khû Bushman ǂgwi-ja (stems and leaves)
ǂ k"arɔ (tuber)

During the winter there is seldom any sign of this plant above ground for the branches wither and die back with the first frosts. There is a perennial tuber a few inches underground, irregularly shaped and up to a pound in weight, crisp in texture and exuding a little cloudy astringent juice when injured. It has a brown skin and a reddish-brown zoned flesh. Although it is often eaten into hollows, presumably by rodents and insects, it is not eaten by the Bushmen. The stems appear in September and form a loose mat three feet in diameter on the surface of the ground. They are reddish-brown, prostrate and sappy, and the leaves are dull green and fleshy, channelled down the centre on the upper surface and with slightly crystalline appearance. The bright yellow flowers, which are produced in midsummer, are an inch across and quite showy, but open only in the heat of the day. They have two sepals and five petals. The flower-stalk starts bending when the flowers are mature, and by the time the fruits are fully formed it is curved sharply back. The fruits are the size of a small pea, shiny green and pointed at the tip, and covered by the withered remains of the perianth. They become yellow when ripe, with a papery shell and seeds the size of a pinhead.

The tubers of this plant were often unearthed in the more open parts round Nama Pan. I am doubtful whether it should be kept separate from *Talinum caffrum*, which is distributed from the Cape Province northwards to the Sudan and is very variable in its leaves and habit.

[262] The leaves and smaller branches of this species are used by the [252] Bushmen as a green vegetable. They are usually prepared by being pounded in a mortar to a paste which is dark green and slightly slimy and has a faintly acid taste with a flavour of lettuce.

137/x

Pollichia campestris Ait. (4963, 5040) Photograph 15.

A small grey-green bush with much-branched slender soft stems, fairly compact when growing in the open but usually found as a semi-scrambler up to four feet high. The leaves arise in tufts of about three, the tufts being opposite each other and at intervals of anything up to an inch along the stem. They are lanceolate and usually under half an inch long. The plant bears what at first sight appear to be fleshy translucent fruits like small white or yellowish mulberries, but which are actually parts of the flowers.

This is a widespread plant throughout Africa, and was seen at intervals all along the route taken by the expedition.

The fleshy parts of the flowers are edible and sweet, with a queer earthy flavour, and are loosely attached so that they may be easily collected by pulling the stems through the hands. The plant, however, did not appear common enough to be of importance as a food. [262]

Boscia albitrunca (Burch.) Gilg and Benedict (4998, 5208) Photograph 16.

!h3: Bushman.....	≠hun
ǂganakwe Bushman...	n|ßu-ni
ǂgikwe Bushman.....	n|ßu-ni
Naron Bushman.....	n|ßu-ni
Eastern !khū Bushman	zā

This is a rather variable tree, sometimes with erect branches and sometimes with a spreading crown, usually bearing many thin twigs with much dead wood among them. The bark is sometimes loose, dark and coarsely fissured and sometimes white and flaky. The species was also often seen in the form of a many-stemmed shrub about four feet high. It is evergreen, and did not seem to be at all affected by the heavy frosts that were experienced in the central Kalahari. The leaves arise singly or in bunches of four or five from small knobs on the twigs, and are leathery and about one inch long and a third as wide. Although the flowers are small and inconspicuous as individuals, they are borne in masses towards the tips of the twigs and make quite a show. In the Cape and the Transvaal at least the tree appears to be sporadic in its flowering. The fruits are borne on half-inch jointed stalks, and are half an inch in diameter, pale-skinned and translucent, with several large stones surrounded by a thin, watery pulp.

The tree was scattered evenly throughout the country from Molepolole to Ghanzi and Gautscha Pan, and has been recorded from the Cape Province northwards to the tropics. It occurred singly, occasionally in open communities, but it was never seen to form thickets.

The fruits are eaten by the Bushmen, but they do not make pleasant eating, for the pulp has a rather slimy texture and a sickly-sweet taste. [262]

Sim (1907: 123) refers to a meal which is prepared from the roots by drying and beating them. The resulting meal is then sifted to remove the fibres and may be made into a porridge. There are reports of gastro-intestinal disturbances after the eating of Boscia roots, but the reports have not been confirmed, and Steyn (1934: 561) fed large quantities to a rabbit without ill effects. It is suspected that people are susceptible only when they are not accustomed to this food. The Bushmen were not asked about their use of the roots, and did not volunteer any information. [252] [114 124]

The older trees are often hollow, and form natural reservoirs for rain water which is tapped by the Bushmen. (See Adansonia.) 312 824

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

[262] 411 824 It furnishes the Bushmen not only with an edible gum, but also with the material for making quivers. These are made from the lateral roots, which are a foot or so below the surface. A suitably straight length is exposed and cut through, and after the cortex has been loosened by gently pounding it, it may be slipped off the woody central portion. The tube so obtained is then covered at one end with skin. The roots of this tree, like those of *Acacia giraffae*, have a most unpleasant smell when cut, something which is not apparent in the above-ground parts.

X137 ***Burkea africana*** Hook. (5332) Photograph 18.

Eastern !khû Bushman -!k'u

An evergreen tree, with attractive drooping grayish compound leaves which are silvery when young. The tips of the youngest twigs are covered with a dense reddish pubescence, but this soon wears off and the older branches and the stem have a dark brown rough bark. The flowers are small but massed in showy hanging spikes six inches long and as thick as a pencil. They are cream-coloured and scented, and produce flat one-seeded or two-seeded pods two inches long. In the Transvaal the tree has a spreading crown. Beyond Tsau the habit was very different—the branches were ascending and shorter and gave the tree a slender appearance almost like a Lombardy poplar.

It is a widespread species in tropical Africa, extending from the Magaliesberg northwards to Abyssinia and Nigeria (Codd, 1951:61). Along the route of the expedition it was scattered from the south up to a point 171 miles from Molepolole, after which it was not seen again until 65 miles north-west of Tsau. It was found only on heavy sand, and beyond Tsau where sand and hard soil sometimes alternated at intervals of a mile or so the corresponding zones of Burkea were sharply defined. The central gap in its distribution is probably a climatic one, for there was deep sand in this area and conditions were apparently ideal for Burkea.

136 262 Burkea occasionally produces a little edible gum from injuries, but it is more important indirectly because of being the host of at least two edible caterpillars, one being the larva of the moth *Nudaurelia bellina* Westwood. This caterpillar is in length and thickness slightly bigger than one's little finger. It is marked with black dots on a yellowish-green ground, with a black transverse band just below each segment and a row of stiff black bristles on each segment. It is recorded from South West Africa and is no doubt known to the Bushmen and eaten by them, but as the expedition passed through those parts too early in the season no specimens of the caterpillar were seen. The Bushmen did bring in the pupae of what they said was an edible caterpillar, and Mr. L. Vari of the Transvaal Museum was unable to distinguish them from the pupae of *Nudaurelia bellina*. One cannot, however, assume from this that they are in fact the same, for the pupae of different species in this group may be indistinguishable.

136 Another caterpillar found on Burkea and recorded also from South West Africa is the larva of the moth *Cirina forda* Westwood. It is black below and silvery or golden yellow above, with a line of black markings down the centre of the back. It is sparsely covered with long white hairs. Many other species of caterpillars have similar hairs which are extremely irritant, but these are quite harmless.

X137 *triloba* they are what is known as dorsifixed, that is they are fixed a little way up from the base so that the stipule is free at both ends. The flowers are the same size in the two species and have the same long stalk, but those of *Vigna triloba* are predominantly purple. They tend to open in the early morning and to close during the heat of the day.

Vigna triloba is reported from a variety of soils and is widespread through southern Africa, but it was not seen on the expedition until the Nama Pan area was reached.

262 [252] It has a finger-thick tap-root which is edible after boiling or roasting, although fibrous and slightly bitter. In mature plants it may extend downwards further than can conveniently be dug, but it is easily broken off. There appear to have been no previous records of its use as a food plant.

X137 *Commiphora pyracanthoides* Engl. (5137) Photograph 23.

Eastern !khũ Bushman a|ño

A deciduous, rigid, twiggy two-foot shrub with spine-tipped twigs, branches that curve downwards, and a bark that is pale green and flaky on the older parts and grayish on the young twigs. The flowers are less than a quarter of an inch long and inconspicuous, and are borne in bunches on small knobs scattered along the twigs. Male and female flowers are on separate plants. The knobs also bear the leaves, which appear after the flowers and are glaucous, simple and finely serrate, and about three quarters of an inch long and half an inch wide. The fruits are "ovoid, about the size of a green pea, though reddish brown when ripe. When the fruits are ripe, the fleshy covering may be easily split apart in two halves exposing the black seed with a red aril covering it partly at the base and extending in four slender 'fingers', producing an intriguing pattern". (Codd, 1951:87.)

The species extends from South West Africa to the northern Transvaal, but was uncommon in the area round Nama Pan. One specimen collected there was grown in Pretoria. Leaves and flowers were obtained in the summer following, and from this material the determination was made possible.

[262] 312 ● 824 The plant exudes an edible gum from injuries and is a useful source of water in an emergency, the water being in a sappy underground organ which is like that of one of the following species of Commiphora, No. 4994. It is known as a water plant among the Bantu of the Transvaal as well.

X137 *Commiphora* spp. (4994 edible, 5030 inedible).

4994		5030	
!hɔ: Bushman..	dʒã	|gikwe Bushman	!ana
|xikwe Bushman	dʒã		
Naron Bushman	|uri		

Two species of Commiphora were collected in the Kalahari south of Ghanzi. They were completely deciduous rigid two-foot shrubs with many sharply-tipped twigs and a flaky bark. At first sight they were identical, and even close examination revealed no bigger difference than that one of them was a little more of a thicket than the other and slightly grayer. The Bushmen, however, stated emphatically that the grayish one was poisonous and the other not. They said also that the grayish one WAS THE HOST OF THE INSECT WHICH THEY USE FOR MAKING THEIR ARROW POISON, AND THAT IT HAD HARDER ROOTS THAN THE OTHER.

8.24 [278] [825]

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

was the host of the insect which they use for making their arrow poison, and that it had harder roots than the other. The fruits, flowers and leaves might have shown the difference clearly, but no trace of them could be found, and though plants were sent to the Transvaal for growing they failed to become established.

In spite of its unpromising appearance, the non-poisonous one is a useful source of water. This is in a sappy unbranched vertical underground part about an inch and a half thick. The Bushmen excavate down its length as deeply as they can reach, then break it off and withdraw it. They remove the thin outer skin and chew the remaining part, which is crisp and has a little tasteless sap. As a source of water it does not compare with the various species of Cucurbitaceae—weight for weight it contains far less, and the labour of digging it up is considerable. However, it must be a reliable standby when the Cucurbitaceae are not in fruit, and in the central Kalahari it is plentiful. In the southern part it is apparently absent, for it was not seen until 256 miles north-west of Molepolole.

Dichapetalum cymosum (Hook.) Engl. 5109, 5266, 5338 Photograph 24.
Eastern !khũ Bushman ma-ĩ

This plant produces a number of slender erect woody stems up to 12 inches high, sparingly branched and often buried in the sand at the base. The leaves are four inches long, numerous, sessile, alternate, broader in the upper half where they are about one and a half inches across, and tapering at the base, with a stiff papery texture and with veins prominent above and below. They have a slight bloom on the upper surface and the younger leaves at least have a pair of narrow hairy stipules at the base. The younger parts of the plant are hairy, but the hairs wear off with age, and during the winter the leaves turn brown and hard and finally drop. The flowers are scented and have white petals forked at the end, but as they are small and nearly covered by the sepals, they are not conspicuous. The fruits are like a loquat, and may be brown or yellow. The have one or two big seeds covered by a little flesh.

Dichapetalum is distributed widely but patchily from the northern Transvaal through to Angola and Rhodesia. On the expedition it was seen for the first time between Tsau and Kaikai, and beyond that it was fairly frequent but scattered. It was usually in open situations, and seldom where there was dense tree growth.

Though the leaves are extremely poisonous, the flesh of the fruits is harmless and is eaten by the Bushmen. They emphasised that the flesh only could be used, and that the stone was poisonous. They did not mention the skin, but the following note on Schoenfelder's specimen 31, in the National Herbarium, indicates that it, too, is poisonous:—

> "Fruits like small yellow oranges are eaten peeled in great quantities by the Kung Bushmen. When still green can be eaten after baking in hot ash. Used like fruit, fresh. The peel of the fruit is stamped and mixed with other food to poison stealing dogs (Diriko)."

Marloth (1913-25: II: I: 120) and Engler (1912: 577) also refer to the edibility of the fruits.

There are four other plants of very similar appearance which could be confused with *Dichapetalum cymosum*, and although they were not collected on the expedition, their distribution does overlap. They are *Pachystigma pygmaeum*, *Pygmaeothamnus zeyheri*, *Parinari capense* and *Diospyros chamaethamnus*. The first two bear inedible fruits and may be

X137 [262] distinguished by their having opposite leaves. The latter two bear edible fruits and like *Dichapetalum* have alternate leaves. The differences are that *Parinari capense* has leaves dark green above and covered with a white felt below, and that *Diospyros chamaethamnus* has no stipules.

Another species, *Dichapetalum venenatum*, has been described, but is in my opinion not specifically distinct from *Dichapetalum cymosum*.

Ricinodendron rautanenii Schinz (5336) Photograph 25.

Eastern !khũ Bushman ,ǁk'a:

The trees seen on the expedition were about 25 feet high and were then (at the end of August) quite bare, resembling slender baobabs, with similar but thinner stems, and smooth bark and stubby branches. Specimens collected elsewhere showed that the leaves are digitately compound, with about five leaflets and two prominent green glands at the top of the leaf-stalk. They are dark green above and pale below and covered with a pale to brownish powdery wool which is found on the young twigs and fruits also. The trees are either male or female. The small creamy flowers are borne in bunches towards the tips of the twigs and the female flowers give rise to reddish fruits the size of a small plum, consisting of a thin pulp surrounding a very hard nut. This is light coloured like an almond, thick and strong and marked all over with numerous small pores.

The only trees seen were on heavy sand near the banks of the Eiseb omuramba, 29 miles from Gam on the way to Windhoek, where they were dominant in a belt several miles wide. They formed a woodland, with the trees spaced about 25 yards apart. Herbarium records show that this is the usual mode of occurrence. The species has been recorded from South West Africa, the Bechuanaland Protectorate, Rhodesia and Portuguese East Africa.

252 262 The pulp of the fruit is edible raw or stewed. It does not readily go bad, but in time it dries and shrivels and in this condition, turned hard and crumbly, is still a wholesome food, edible raw or cooked. The stone contains one or two firm white-fleshed kernels which are, like the pulp, edible raw or cooked. The tree is an important source of Bushman food because of the quality and quantity of its fruit and because the fruits remain good for a long time even without being stored. Those seen on the expedition were on the ground beneath the trees and were still perfectly [312 824] good to eat. The tree is additionally useful in that it sometimes collects and holds rain water in hollows in its trunk (see Adansonia).

X137 *Sclerocarya caffra* Sond. (5292) Photograph 26.

Eastern !khũ Bushman -gai

A few mature specimens were seen, about 20 feet high, and a few young ones. The mature trees had a single clean bole with a flaking bark and a branching rounded crown, and were very different in appearance from the young ones which consisted of four or five thick and sappy unbranched stems about five feet high, with a smooth brown bark. This was in August, and all were quite leafless. The following description is taken from Codd (1951):— "The leaves are pinnate with three or four pairs of well-spaced leaflets and a terminal leaflet. The leaflets are oval, smooth, tapering to an abrupt point and are about one and a half inches long and one inch wide. Flowers are inconspicuous and are produced in small sprays just before the appearance of the young leaves, some trees

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

X137 *Grewia retinervis* Burret (4875, 5066) Photograph 31.

!h3: Bushman.....	ʘb3:
ǁganakwe Bushman...	ǁ?ani
ǀgikwe Bushman.....	ǁgani
Naron Bushman.....	ǁgani
Eastern !khû Bushman	!gwa

A straggly many-stemmed five-foot shrub, sometimes a weak scrambler up to 10 feet high. The stems are half an inch thick at the base, rounded and slightly woolly when young, slightly flattened and glabrous when old, and tough and pliant. Its leavers are alternate, pale green, one and a half inches long and an inch wide, ovate with a pointed tip, toothed, and roughly hairy to the touch. They wither and fall soon after being frosted, but if out of reach of the frost remain on the bushes at least until the end of July. The plant bears spreading yellow flowers half an inch wide, and fruits the size of a pea, with a papery brown skin enclosing a few large pips and some fibrous mealy material. *Grewia retinervis* is closely allied to *Grewia flavescens*, so much so that I doubt whether the two should be considered anything more than varieties of one species. The differences are that *Grewia flavescens* is usually taller, and not so conspicuously veined on the upper surface of the leaves. Mr. B. de Winter, of the National Herbarium, Pretoria, has observed also that its older stems are square in section and those of *Grewia retinervis* are flattened.

Grewia retinervis was scattered over most of the area covered by the expedition, and common in the central Kalahari, specially in open grassy country. It has been recorded from the northern Cape and the Transvaal as well as South West Africa and the Bechuanaland Protectorate.

262 The fruits are edible. They ripen in winter, and have a slightly sweet [251 taste and a pleasant flavour. They may be stored after being dried, and 252] are then soaked or boiled before being eaten. The crop, if one may judge from the 1955 season, is abundant, and the amount fairly constant for all the bushes. The fruits form an important part of the Bushmen diet, [146 although little of them appears digestible. The roughage is voided almost 147] unchanged, in enormous faecal masses up to two and a half inches in diameter.

824 The dry stems of this plant nearly always contain the tunnelings of 372 grubs, and the tunnellings are packed with their excreta in the form of a brown, pith-like substance which forms a useful tinder. The Bushmen split the stems down the centre, make a slight depression in the flat surface and use this as a socket for the fire-drill.

X137 *Grewia* sp. aff. *Grewia bicolor* Juss. (5056).

Eastern !khû Bushman gamak'wɔ:

A slender shrub up to six feet high, with many sparingly branched stems. The leaves are one and a half inches by one inch, very finely toothed, dark green above and pale below, pointed at the tip and rounded at the base. Both surfaces are covered with a fine grayish felt which is thicker on the lower surface. Typical *Grewia bicolor* has wool on the lower surface only. The fruits are the size of a pea, and have a little flesh covering usually one big seed. No flowers were seen.

This is another of the plants with a distribution which begins in the Ghanzi area and extends northwards, and the remarks made as to the distribution and importance of *Grewia flavescens* apply here also.

[262] The fruits are edible.

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

137X

Adansonia digitata L. Photograph 32.

Eastern !khũ Bushman ≠m

The Baobab, as it is commonly called, is shown in photograph 32. Its stem may have a circumference of up to 148 feet, and makes it quite unmistakable. In winter it is leafless but in summer it bears dense dark-green foliage. The flowers are pure white and up to six inches across, and the fruits, as described by Codd (1951: 120) are "oblong or egg-shaped, five to six inches or more in length and three to four inches in diameter, with a woody shell which is softly grey-velvety on the outside".

The southernmost specimens were seen in the neighbourhood of Ghanzi, and from there it occurred sporadically to Gautscha Pan, the furthest point north reached by the expedition. There were big gaps in its distribution and it was rare throughout, but in some parts of the Transvaal it occurs abundantly and may have an unbroken distribution over many square miles of country. It is widely distributed in the drier regions of north and south tropical Africa.

Inside the shell of the fruit is a white, pith-like substance which may be eaten raw, or ground up and stirred into water to make a drink, or boiled to make a porridge. It has an acid-sweet taste. The seeds which are embedded in the flesh are also edible and are eaten like nuts. In other parts of Africa they are prepared in a somewhat involved way which includes protracted boiling, fermenting and drying. There are several records of the fact that the young leaves make quite a good substitute for spinach, but as the expedition was during the winter and as the trees are deciduous, I cannot say whether the Bushmen know of this, nor whether the trees we saw were of the glabrous variety which is the one used for spinach. No seedlings were seen. It is known that the white shoot from the germinating seed can be used as a substitute for asparagus, and that the tender root of the very young Baobab is also edible (Dalziel, 1937: 113). The trees are often hollow, and like *Boscia albitrunca* and *Ricinodendron rautenii* may act as reservoirs for rain water which can be used in times of scarcity. The Bushmen reach it by fitting hollow grass stalks end to end to form a tube, and sucking it out. A further product of the Baobab is a large caterpillar which feeds upon the leaves and which is an important article of food aming the Natives of the northern Transvaal. It is recorded also from South West Africa, and is very likely known to and used by the Bushmen.

252 262 [272] 271 312 824 262 136 825 137X

Ochna pulchra Hook. (5273) Photograph 33.

Eastern !khũ Bushman !i and !e:i

A semi-deciduous tree with a clean but usually rather twisted bole which is white to light gray and has a peeling bark. The branches are bent and rigid and the wood brittle. They bear glossy light green alternate leaves which are almost sessile and usually entire, rarely with a very finely toothed margin. The tree has an attractive appearance even in winter, and the young leaves add to this in the spring for they range from pale green to reddish-brown. The flowers are borne in early summer, in showy scented bunches. They have yellow petals and a green calyx, which persists after the petals have fallen and turns bright red. The fruits are hard and green when immature but turn fleshy and black as they ripen. There are usually two or three, the size and shape of small beans, attached to a fleshy red swelling in the centre of the flower. The leaves have been suspected of causing poisoning in stock, but tests carried out on mammals have so far been inconclusive. (Uys and Thomas 1952, Steyn, 1949: 125.)

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

By the spring there may be nothing left to mark the position of the plant. How extraordinarily observant the Bushmen are was well shown when they were asked if they could find a specimen and demonstrate its use. One man guided the party for four miles across country featureless except for clumps of trees to a spot where he knew of one growing. It was found after a short search—nothing more than two or three small sticks among the grasses, with the bark shredding into white silky fibres.

Raphionacme burkei is found from South West Africa through the Bechuanaland Protectorate into the northern Transvaal and the northern Cape. Two specimens were seen in the central Kalahari, and the species was determined from one of them which was sent to Pretoria for cultivation and flowered there in the following summer.

It is a well-known source of water among the Bushmen of the Kalahari. They extract the water from the storage organ by planing a pile of shavings off it with the edge of a split stick, and then squeezing the shavings in the hand and allowing the water to run into the mouth. This rather roundabout way of doing things appears to be without good reason, because the flesh of the storage organ may be chewed without any ill effect. It is firm and crisp, slightly fibrous, and faintly bitter.

Pentarrhinum insipidum E. Mey. (5171, 5191) Photograph 40.

Eastern !khū Bushman n!ɔ-ʃu and n!wa-ʃu

A leafy deciduous climber up to 10 feet high, and a vigorous grower which may completely cover the host tree. It has freely branching lax stems which are quite tough in spite of being only a matter of an eighth of an inch in thickness. They are covered with a fine white down which is just perceptible to the naked eye, and when broken they exude a little milky juice, so little that it is easily overlooked. At intervals of about five inches arise pairs of leaves, deeply cordate at the base, and with long stalks. In the younger stages they are minutely hairy but they become glabrous or nearly so as they grow older. The flowers rise in a group on a three-inch slender stalk from between the leaves. They are brownish with a yellow or white central portion, small and faintly scented. The fruits are occasionally produced in pairs but are more usually solitary. They are beaked, three inches long and half as wide, covered with blunt prickles, longitudinally wrinkled and dull green.

At Nama Pan this was a frequent climber among the trees, and it is widespread over southern Africa. It was not, however, seen in the country south of Ghanzi.

At maturity the fruits are hard and woody and packed with the fine silky hairs that form the pappus of the seeds, but when green they are softer and may be eaten raw or cooked as a vegetable, and may be stored for three weeks before they deteriorate. Their rather copious white latex is quite harmless. They have a crisp texture when raw and a pleasant flavour, nutty and faintly peppery. When boiled they are reminiscent of Asparagus. When the seeds inside have turned brown the fruit will be found too hard to make good eating. The leaves, too, may be eaten raw as a salad, and are used that way by some Transvaal Natives, but the Bushmen method of preparation is to pound them to a pulp in a wooden mortar.

Pentarrhinum insipidum grows well from seed and is a rapid producer of green material. It might be a useful fodder plant for domestic stock.

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

inch long and less than a quarter of an inch wide. No flowers were seen on the expedition, but from herbarium records it is known that they are yellow and tubular and produce papery pods two inches long and half an inch wide. The pods split down their centre when they are mature. 137X

This plant is known from the northern Cape, the Bechuanaland Protectorate and South West Africa, and was widespread and fairly frequent north and south of Ghanzi.

Although it is not an edible plant it is nevertheless a producer of food, for all the Bushman digging-sticks seen were made from it. The only preparation is that the bark is peeled off, the spines trimmed, and one of the ends cut at a slant. The stick is about four feet long. In sandy soils and for the type of digging usually required it is a more efficient tool than a spade. It may be made to loosen a narrow cylinder of earth, and this cylinder, if a little wider than the object sought, is all that is necessary. With a spade on the other hand it is usually impossible to avoid a funnel-shaped excavation which entails the removal of far more soil. 322 412 824

Catophractes alexandri D. Don (4893) Photograph 52. 137X

!h5: Bushman.....	n!ain!ai
ǁganakwe Bushman...	!ga:!gaba
ǁgikwe Bushman.....	ga:giba:
Naron Bushman.....	n!ain!ai

A five-foot erect silvery bush with opposite leaves, some brightly coloured in the autumn and winter. They often bear slender sharp spines in their axils, which afterwards develop into branches and bear leaves and spines in their turn. The leaves and younger woody parts are covered with a dense white wool, but this afterwards disappears from the woody parts and they become a reddish brown. The flowers, which are about two inches long, are white, trumpet-shaped and showy, and produce a pod covered with short blunt prickles and up to three inches long, dark and woody when mature and splitting down the centre. The seeds have a circular membranous wing round them.

The plant is recorded from Angola, South West Africa, Southern Rhodesia, the Bechuanaland Protectorate and the Transvaal. It was fairly frequent south and north of Ghanzi, in patches down the banks of pans, on limestone, and occasionally also on slight slopes in sandy country.

Catophractes alexandri is not a food plant but deserves mention because of its importance in the preparation of food—it is used as a fire-drill together with *Grewia retinervis*, as is described in the notes on that species. 372 412 824

Corallocarpus sphaerocarpus Cogn. (5020, 5138, 5230) Photograph 53. 137X

ǀgikwe Bushman.....	ǀhurugu
Naron Bushman.....	ǀhɔrɔ
Eastern !khû Bushman	ǀhɔrɔ

A very variable plant creeping by means of tendrils over shrubs and low trees, and with sparse leaves, dissected or lobed and rough to the touch, rising in groups or singly from nodes on the rather sappy stem. The leaves are not flat even when perfectly fresh, but inrolled slightly at the margins as though they were beginning to wilt. Three or four sessile half-inch ovoid fruits are borne in a cluster at the nodes as well, which in

X137 *Citrullus vulgaris* Schrad. (4937, 4999) Photograph 57.

!h5: Bushman.....	dam
ǂganakwe Bushman...	n‖an
ǂgikwe Bushman.....	n‖an
Naron Bushman.....	n‖a-ǂ
Eastern !khū Bushman	‗ǂ'a‗ma

This plant, one of the melons and commonly known as the tsama, has stout six-foot vines half an inch in diameter at the base and a quarter of an inch at the tip. They are covered rather densely with light brown hairs, which turn white and stiff with age. The vines are usually prostrate, but occasionally festoon themselves over grasses and low shrubs with the help of small Y-shaped tendrils, curly at the tips. The leaves are borne on two-inch stalks and are hairy on the ribs, dull green, rough to the touch and deeply lobed. Each plant produces male and female flowers. They are an inch in diameter and pale yellow, and the fruits which follow are rounded and up to six inches in diameter and six and a half pounds in weight. As many as 34, of all sizes, have been counted on one plant. The rind, densely hairy when young but later quite smooth, is dark green mottled longitudinally with light green, and contains a crisp, juicy, tasteless white flesh in which numerous flattened brown seeds are embedded. The melons can endure heavy frosts without becoming spoilt, but the rest of the plant is very susceptible. The frosts, however, merely hastens its death for it is in any case an annual.

This melon is indigenous to south-west Asia and the warm dry regions throughout Africa. The water-melon is merely an improved variety of the same species, which has been known in Egypt and Babylonia since the beginning of history (Marloth, 1913-1925: III: II: 205). The tsama was widespread but patchy along the route of the expedition, and areas of abundant melon alternated with long stretches where it was not seen. It was not confined to the sand but grew also on the hard soil of the pans.

262 The tsama is unquestionably the most important plant to the Bushmen
312 in this part of the Kalahari. They are known to use it as their sole source
824 of water for months on end and it is extremely doubtful whether they would
[184] be able to live permanently in the Kalahari without it. Its importance is
[244] shown by the fact that one group of Bushmen in the central Kalahari had a small patch of tsama which they had grown from seed, and the Bushmen are not as a rule agriculturalists. Nevertheless, the tsama is not an infallible standby, for the reasons given in the discussion on *Citrullus naudinianus*, and when the need arises the Bushmen can and must substitute more meagre but at the same time more reliable sources of water, for example from *Sansevieria scabrifolia*. When it is used for drinking-water
252 the melon is opened at the top like an egg and the central portion cut out
262 and eaten. The rest of the pulp is then mashed inside the rind with a
312 stick to a watery mass which is half drunk and half eaten, the pips being put aside and later roasted and pounded (without being peeled) to make an edible meal. The melons are sometimes roasted before being eaten, which adds a little flavour, and they may be cut up and mixed with meat to form a stew, which is conveniently cooked in the rind itself. Although no bitter specimens of the tsama were found along the route of the expedition, they do occur. Their flesh is poisonous and unfit for human consumption, but their seeds are free of poison and edible after roasting.

000 At some villages of Bakalahari (which are a Bantu tribe), the tsama is regularly cultivated. These and wild melons are collected and stored under shelter, and goats, horses, cattle and even dogs are kept with tsama as the main source of water. The livestock use the melon more economi-

9: Thomas T-5 (1951-1955)1959
FX10 Bushmen FX10
GiKwe
Kung

825 mash the insides, then pull off the head and squeeze the in-
278 sides out like toothpaste from a tube. Both kinds of poison are equally good, they say.

Perhaps the two types of pupae are the pupae of two different kinds of beetles. Perhaps they are from the same beetle but in different stages of development. Perhaps they really are males and females, as Bushmen are often scientifically
[821] accurate, but, as Bushmen also have male and female rain clouds, perhaps not.

[439] Kung Bushmen, who use metal arrows obtained by trading
824 animal skins for wire with the Bantus, have a complicated
825 system of poisoning in which they use several ingredients for
278 the poison paste. One of these is a binding fluid, used because the pure poison squeezed from the grub will not adhere well to metal but must be made binding and sticky. The binding material comes from the bark of a tree. They chew
[415 the bark thoroughly and spit the mash into a little mortar
237] made from the knee bone of an antelope, a nice little cup, into which the Bushmen have squeezed the milky juice of sansevieria plants, got by wringing the heavy, thick leaves. This juice has an irritating effect when it is dissolved in a wound and causes the antelope to rub and scratch its wounded spot against a tree, which stimulates circulation in the area, which carries the poison more quickly through the body, which hastens death.

The paste in the mortar is thoroughly mixed, then smeared with a straw on the foreshaft of arrows, never on the head, for if the sharp edges of the head were poisoned any child might accidentally nick himself and die. When the arrow is poisoned it is propped up by a fire and the poison is allowed to dry into a shiny dark paste, to be melted again by the
411 moisture and warmth of an antelope's flank.
825
278 Gai had stored his poison cocoons in a tiny bag inside his

9: Thomas T-5 (1951-1955)1959
FX10 Bushmen FX10
GiKwe

222 The women stopped and began to gather up the green melons, Twikwe picking them with a mechanical, stereotyped gesture. She first slipped her hand under a melon; then, twisting her elbow, she lifted the melon and held it pinched between the heel of her hand and her forearm, and with a scoop slipped it into the pocket of her kaross on the side. In a moment the side of her kaross was full, and she stood erect for an instant, looked at the sky, shifted her weight, and suddenly the melons rolled to the back of her kaross, leaving the side free for more. She was very efficient. In a moment she had a load. I was a little surprised at her, however, for now she would have to carry the melons with her all day whereas she might have gathered them on the way home. But Bushman women do not seem to mind this.

The women left behind the yellow melons which would have been bitter and rotten, touching them disappointedly with their toes instead. The false spring was hastening the time when all the melons would be gone, forcing the Bush-
222 men to eat roots as a staple diet, not as desirable because of
● 824 the uses that tsama melons have. Melons are eaten as both
[252] food and water, their pulp is added to meat which needs liquid for boiling, their seeds are roasted and eaten or ground into powder and used as flour, their rinds serve as mixing-
[415] bowls, as containers for small, loose objects, as cooking-pots with or without the pulp inside, as urine-containers for curing hides, as targets for the children's shooting practice, as children's drums, as resonators for musical instruments, and all this amounts to a serious loss for Bushmen when the melons rot or dry.

222 We went on until we were about two miles from camp. We were going to an almost imperceptible small hill, a place, said Twikwe, where a great deal of veld food grew. On the way a moving shadow caught our attention, and we looked up

9: Thomas T-5 (1951-1955)1959
FX10 Bushmen FX10
Kung
Gikwe

764 775 move away because they cannot bear to leave the dead person, because they want to make sure that animals do not spoil his body, and because, said Ukwane, "He is our person, whom we love. We do not want to leave until we have given up hope."

764 775 789 824 We learned one other thing, and that was that the Gikwe put a medicine power, a fragrant brown powder made of an herb called *sasa*, in the norstrils of the dead person, and sprinkled his body with sasa before the burial. This, said Ukwane, is done to ensure heavy rain in the rainy season, but also it may well have to do with protecting the living from the spirit of the dead. We did not learn more about this because Bushmen will talk about any subject you may name except the subject of the spirits of the dead. The Kung respect and fear spirits more than any other thing, and only after a year of trying did we learn about them; the Gikwe seem to feel the same way, and for that reason we did not expect to learn very much. We did find, however, that the spirits 775 of the dead are called, at least sometimes, the *kwe be ha ki* (person who is not here), and that these spirits travel in the [82] wind—not in open, blowing wind, but in whirlwinds; that is why the Gikwe Bushmen avoid whirlwinds, because a spirit might be there to carry them away. Once a whirlwind passing through our camp uprooted a tent and carried it spinning to the sky. Possibly, explained the Bushmen, a spirit of the dead thought that there was a person inside, although sometimes the spirits cause only mischief.

764 184 With the Kung, the funeral customs are very much the same as those of the Gikwe. The body is folded into a sitting position and bound, but the head is bowed down to the knees. Beads and a kaross ornament the body, which is also lowered into the grave and buried upright, but thereafter the custom

9: Thomas T-5 (1951-1955)1959
FX10 Bushmen FX10
Kung

work required on the farms, and also because certain members of the families were still here and now these families were broken forever.

On our way to see Short Kwi, the brother-in-law led us to the far end of the werf, behind a clump of bushes, to the scherm where Short Kwi lived. We saw him there, sitting with his wife and little daughter by the ashes of their fire, side by side, and we caught our breath at the sight of him. He looked tiny, no bigger than a child, and his flesh had wasted away so that his pale skin stretched tightly over all his bones. His leg was hidden by a blanket, his hands were as thin and fragile as a girl's, and his eyes were huge. He looked up at us when we came and smiled wanly, wryly, and his wife and daughter looked up at us and his wife also smiled wanly, but his daughter did not smile at all. The first thing Short Kwi did was to rearrange the blanket over his foot to hide his toes, but not before we had seen them, dry and black, dead entirely like the toes of a mummy. His leg was the first thing in his mind, but this was natural; we reminded him of better days.

We sat down at his fire to talk, all of us who had come from Nama and most of the people from his werf, and his wife gave those of us from Nama a palmful of sa, the finely powdered yellow-green leaves that smell halfway between roses and sage. We crossed our faces with it, sprinkling a stripe up the bridge of our noses to our foreheads and another stripe across our cheeks. It smelled very nice, a sweet present to give to someone who has arrived from a long journey. Hours later it was still fragrant and we could smell it, faintly, for days.

We asked Short Kwi to show us his leg and as he started to unwind the blanket the Bushmen from Nama leaned forward, fascinated, but the other Bushmen did not look because they had seen it before. Short Kwi drew back the blan-

222 461 on the season. In the long days of wilting between the October spring and the January summer, food is scarce and the women may go out every day into the failing veld, leaving their *werft* early in the morning and returning late in the afternoon. All 222 422 593 that a woman gathers belongs to her alone, and of course is shared with her family. She feeds her husband, her children and often a visitor or two, at her own hearth. No formal instruction 222 868 857 is practiced among the !Kung, with the possible exception of certain kinds of religious teaching and what might be called an occasional hunting school. Learning to gather comes from the children's observation of the more experienced women. Girls soon learn to [824] recognize more than a hundred kinds of edible plants that grow in *Nyae Nyae*, as well as the seasons and places in which these plants grow. They learn to see tiny, shriveled root vines coiled around thorns in the thickets and, in the process, develop fine powers of observation. Possibly complementary to this lack of formal instruction, no formal pressure is exerted on young people to take up adult roles. Girls, if they wish, accompany their mothers on gathering trips. If they do not, they rarely feel guilty. A girl usually be- [582] gins to feel responsible soon after she marries, which is often before puberty. But only when she has children of her own does a woman see the world through the eyes of a provider.

12: Marshall E-5 (1951-1959) 1961 FX10 Bushmen FX10
Kung

SINEWS

Made and used by men

bow-strings
wrappings for arrow-shafts (the poison adheres well to sinew)
binding for hafts
snares

Made by men, used by all

strings for *//gwashi* (musical instrument)

Made by men or women

fine rolled cord

HORN

Made and used by men

horns fitted with leather covers for carrying arrow-points
horns for cupping

Used by all

horns for pipes
horns for spoons

SHELL

Made by men, used by all

ostrich egg-shell water-containers
tortoise-shell dippers
tortoise-shell containers

Made by women

ostrich egg-shell beads

FEATHERS

Used by boys on *jani* toys
Worn by all occasionally in hair

VEGETABLE MATERIALS

WOOD

Made and used by men

bows
spear handles
axe or adze handles
knife handles
knife sheaths
spring-hare hook handles[1]
fire-making sticks
hatchet bow (musical instrument) (few)

Made by men, used by all

digging sticks
carrying sticks
stirring sticks
mortars and pestles
bowls
spoons
fire scrapers
//gwashi (musical instrument)
one-stringed violin
jani toys
beads

Made by women

frames for scherms

FIBRES

(from *sansevieria*, aloe, */nea* tree roots, other roots)

Rolled by men and women

cord

Made and used by men

carrying-nets
snares

Made and used by all

ornaments

GRASS

Made by men and women

stoppers for ostrich egg-shell water-containers
ornaments

Made by women

scherms

Made by children

toys of grass folded and woven to suggest animals

Used by all for beds

[1] Bushmen use sticks 12 to 15 feet long made of flexible rods in 3 or 4 sections, with a hook fastened to the end, to hook spring-hares which live in deep burrows. They seldom succeed but keep on trying. They carry only the hook around with them and whenever they need a handle they make a new one.

12: Marshall E-5 (1951-1959) 1961 FX10 Bushmen FX10
Kung

VEGETABLE MATERIALS (*contd.*)

Reeds

Made and used by men
arrowshafts

Used by women
strips for tying frames of scherms and for tying grass on scherms in times of high wind

Worn by all as head and chest bands

Bark

Made and used by men
quivers

Tsi Nuts

Used by all as beads
Used by boys as weights for *jani* toy

STONE

Made by men
arrow-straighteners
pipes

Used by men for
sharpening blades
hammers
anvils
weights to stretch nets
marking graves

Used by women
powdered red earth for ceremonial markings on face

OBTAINED BY TRADE WITH BANTU

Malleable Metal and Wire

Made and used by men
arrow-points
spear-blades
spring-hare hooks

Made by men, used by all
pipes
awls

Used by men
knives
axes or adzes
chisels (few)
files (few)
fire-strikers) (few)

Used by all
beads—copper, glass, shell, &c.
pots—Bantu clay, European iron
pipes (few), European briar, old cartridge-shells
receptacles (few)
old scraps of garments and blankets
oddments such as buttons for ornaments

Résumé

LE PARTAGE ET LE PARLER: SOULAGEMENT DES TENSIONS SOCIALES CHEZ LES BANDES DE BOSCHIMANS /KUNG

Dans cette communication, l'auteur décrit plusieurs coutumes de Boschimans /Kung dans la région Nyae Nyae de l'Afrique du sud-ouest, coutumes qui les ont aidés à maintenir des relations pacifiques au sein de leurs groupes et entre les divers groupes de la région. Ces coutumes ont été observées au cours des expéditions Marshall de 1951–9. Les modifications

15: Marshall E-5 (1951-1961) 1965
FX10 Bushmen FX10
!Kung

guages, some now virtually extinct, were characterized by a fifth click made with the lips, called the kiss click (⊙). In addition to clicks, the Bushman languages have tones: high, middle, low, rising, and falling. Oswin Köhler has given special attention to tone as well as to other features in his study of Bushman languages, especially Barakwenga (Köhler 1962).

Each of the large divisions of the Bushman languages—the northern, central, and southern divisions (see Bleek 1956)—differs markedly from the others. Within each group are several languages, sometimes resembling each other enough to be considered merely dialects of the same language, but more often differing so widely as to be distinct, mutually quite unintelligible languages. The !Kung described in this chapter (Köhler's and Westphal's !Xũ) belong to the northern group.

HABITAT • The Kalahari Desert, some 1200 miles long, with a mean high altitude of about 3000 feet, forms part of the great plateau of southern Africa. It is a basin in form, covered with wind-blown sands, sometimes red, sometimes white, to a depth of 300 to 400 feet. The underlying rock crops out rarely in ridges and a few low hills.

Stamp (1953:78) classifies the Kalahari as a semidesert. Its conditions are not the most extreme. Our expeditions recorded daytime air temperatures in the shade up to 115° F. and sand temperatures in the sun up to 140° F. In winter the temperature at night falls below freezing but for most of the year the nights are temperate. Although they seem acclimated to the heat, the Bushmen appear to find the colder temperatures very uncomfortable and shiver violently if they are away from their fires when the cold south winds blow.[8]

The rainfall, which comes in summer thunderstorms—6 to 10 inches, increasing in the better-watered parts toward the north, according to Wellington (1955:61)—though slight, is sufficient to sustain a varied drought-resistant vegetation, and the country is covered with grass, brush, and scant small trees. In the northern and northwestern parts, the trees are more numerous and taller and include shivi groves and nut-bearing mangetti—important sources of food to the Bushmen. And in all the areas of the desert that Bushmen inhabit are found edible plants, in scant, far-apart patches perhaps, but existing. The vegetation, furthermore, provides material for fires, shelter, weapons, implements, tanning, poison for arrows, and juices (for example tsama melons, on which these people can live when there is no water). In short, this desert provides the things that make life possible; otherwise the Bushmen would be dead or somewhere else.

The desert is a forceful shaper of the outlines of Bushman culture, and both the possibilities it permits and the limitations it imposes have been meaningfully summarized by Robert Story in a personal communication:

15: Marshall E-5 (1951-1961) 1965
FX10 Bushmen FX10
!Kung

for stretching carrying nets, and for pounding things. Informants said they had never seen or heard of stone arrow points or blades. They still use bone and wood points occasionally but have for the most part changed over to metal for knives, axes, assegai blades, and drills, as well as for arrow points.

From wood the men make bows and quivers as well as sticks for making fire, digging, carrying, and stirring; handles for knives, axes, and assegais; bowls, spoons, mortars, and pestles; and musical instruments—the five-stringed //*guashi* and a one-stringed violin. Reed and bone are available in plenty for arrow shafts. There are abundant fiber and sinew for the excellent cordage that men and women make. Little tortoise shells are dippers and cosmetic boxes. Hides, although not abundant, are sufficient—in the Nyae Nyae region at least—for everyone to have a kaross, for the men to have breechclouts, and for the women to have modesty aprons and skins to wear around the buttocks. All have sewn skin bags. These objects of hide are made by men because they are products of the hunt. Frequently there are surplus hides for trade.

Ostrich egg shells are used for water containers, and women make ostrich egg shell beads. This is the one important craft of the women and the one for which Bushmen are noted among the surrounding peoples. Good ostrich egg shell bead ornaments are the most prized possessions of the !Kung. The women also make ornaments of European beads and of grass and thongs and *tsi* nuts. They very much enjoy ornamenting themselves.

The !Kung decorate their artifacts occasionally with rather meager scratched designs but have not developed graphic, pictorial, or sculptural arts to any appreciable extent.

The !Kung trade with their Tswana and Herero neighbors, offering well-tanned hides, ostrich egg shell beads, and a red powder they make from the dead heartwood of a certain tree. Usually what they want most of all in exchange is tobacco—for they are passionately addicted smokers—and malleable metal from which they shape their arrow points and assegai blades. They also want knives, axes, European beads, and either the round-bottomed Ovambo pots or European iron pots. Once in a while they get an old chisel or file, a basin or cup, or a few miserable scraps of cloth garments. The little Bushmen find the bigger, more aggressive Bantu hard bargainers and are rather at their mercy.

The significant thing about !Kung artifacts from a social point of view is that they are not accumulated as wealth and their possession does not symbolize high status or bestow prestige. It is not advantageous to multiply and accumulate in this society. Any man can make what he needs when he wants to. Most of the materials he uses are abundant and free for anyone to take. Furthermore, in their nomadic lives, without beasts of burden, the fact that the people themselves must carry everything puts a sharp limit

881
252
291
301
302

The *Choa* Ceremony The mother takes the girl's hands to scrape the tsi out of the ashes.

881
252
[824]

choa-ed. The old woman who attends her performs this part of the ceremony (or her mother may do so). She scrapes a root called *sha sha* into the water hole. To *choa* the veldkos, the old woman takes the girl's hands in hers and together they place the veldkos in the fire. When it is cooked, they scrape it out together and the old woman puts *sha sha* in her mouth, chews it, and blows on the girl's hands and on the veldkos. This protects the girl from having an upset stomach. Each veldkos must be *choa*-ed the first time the girl eats it after the First Menstruation ceremony.

841
[224]

No ceremonials mark subsequent menstruation periods, and the women do not seclude themselves during the flow or avoid gathering veldkos or dipping water from the water hole. They continue only to practice certain avoidances that in general have to do with men's hunting. The menstruating woman must not touch hunting gear; it would be very bad, for the arrows would be useless. She must not have sexual intercourse with her husband; it would make him tired and thin. Men in the years of their hunting prime should not talk or listen to talk about menstruation, for to do so might make them lazy in hunting.

881
304
[852]

The girls who are married before their first menstruation have the same menstruation ceremony when the time comes as do the unmarried girls.

There is no genital mutilation practiced among the girls and women of the !Kung. Girls are scarified, but not at the time of the menstruation ceremony. The scarification is begun when the girl is about seven or eight and is continued little by little over several years. Stripes are made on the legs,

of animals named and known by the Dobe area Bushmen. Of these 420 species, 350 species were collected and identified by the author. Two-thirds of the plant species and half of the animal species are utilized by the Bushmen. Of these, they classify 85 species of plants and 54 species of animals as edible. It is therefore evident that the Bushmen have a remarkably broad subsistence base. On closer examination, however, one finds that the Bushmen are highly selective in their food habits. In fact, only nine species of plants constituted about three-quarters of the total vegetable diet; and one species alone, the mongongo nut, accounted for at least half of the total. Furthermore, of the 54 animal species eaten, only 17 species were consistently hunted.

A plant species may be regarded by the Bushmen as a major food for one or more of several reasons. Certain foods are prized because of their abundance or because of the long season during which they are available. Other foods are prized because of the ease with which they are collected. For this reason fruits are generally more popular than roots since the latter have to be dug out of the ground. Then there are foods which are especially good tasting and/or believed to be highly nutritious. The various plant foods are evaluated pragmatically and rationally and few species are restricted by magico-religious taboos. This is in sharp

825
262 contrast to the evaluation of animal foods all of which fall under taboos of varying strictness.

824
262 By using these criteria of abundance, duration of eating season, ease of exploitation, tastiness and nutritional value, the Bushmen have arranged the universe of edible plants hierarchically in terms of the overall desirability of each species as food.

This scheme divides the 85 edible species into six classes:

I.	Primary	1 species
II.	Major	8 spp.
III.	Minor	14 spp.
IV.	Supplementary	32 spp.
V.	Rare	13 spp.
VI.	Problematic	17 spp.
	TOTAL	85 species

I. Primary food - All Bushmen of the Dobe area agree that their primary food is the nut of the mongongo (mangetti) tree: Ricinodendron rautanenii. This food rates high on all the criteria of desirability described above. It is superabundant (millions of nuts rot on the ground each year for want of eating); it is eaten in all months of the year; it is easy to collect, has a delicious taste, and is highly

262
824 nutritious.[1]

It should be added that meat is considered by all the Bushmen as a primary food. Informants agreed that an ideal diet should consist primarily of meat and mongongo nuts. In actual practice this ideal is not always attained.

II. Major foods - After Ricinodendron there are eight species that Bushmen consider as major foods but none of these rate high on all five criteria of desirability. There are three species which are superabundant in quantity and delicious to the taste, but are available for only a short period of the year. They flourish during the rains but by winter, three months later, they have become shrivelled and dried out. The three summer species are: Grewia flava, the morethlwa berry; Ximenia caffra, the sour plum; and Citrullus

[312] lanatus, the famous Tsama melon. The latter species also serves as an alternative source of water but this is not important in terms of food strategy because the season of Tsama melons coincides with the season of abundant standing water. Among the /gwi Bushmen of the Central Kalahari Game Reserve, the Tsama melon is a more important source of water because it

---

[146] [1]The nut of Ricinodendron has been chemically analyzed (quoted in Watt and Breyer-Brandwijk 1962:428). The kernel of the nut was found to yield 60%, by weight, of a quick-drying fixed oil, rich in proteins. The fruit of the nut, which is also eaten by the !Kung Bushmen, yielded, among other constituents, 31% saccharose and 7.9% protein.

824
262 persists into the winter dry season (Silberbauer 1965).

The fruit of the baobab tree, Adansonia digitata, is another of the major foods. It is most important during winter but tends to rot if left on the ground and therefore cannot be eaten in all months of the year.

The vegetable ivory palm, Hyphaene ventricosa, has two edible parts. The fruit of the mature form is abundant but yields very little of food value. The dwarf form of the palm lacks fruit but the heart of the stalk is an important item of diet. This latter food has two distinct disadvantages. It is difficult to collect because the stiff palm fronds must [164] be laboriously hacked away to reach the heart. Also those who eat its fibrous pulp complain of stomach cramps and diarrhea. Therefore it is eaten only when more desirable foods are not available.

The nut of the morula tree, Sclerocarya caffra, is a delectable food, even tastier than the mongongo nut. But it rates low on the important criterion of ease of eating. The nut meats are small and crumble easily; so they must be carefully picked out of the shell with a thorn. This operation requires patience and it was observed that the women ate many more morula nuts than did the men. The morula tree is also important in subsistence because one of the species of beetle used in arrow poison feeds on its leaves.

824
262

Bauhinia esculenta, the "Tsi bean", ranks with Ricinodendron as the primary food of the Nyae Nyae Pan area (L. Marshall 1965), where both the beans and roots are eaten. In the Dobe area, however, this species of Bauhinia has a spotty distribution. In order to reach the large groves, the Dobe area Bushmen must travel long distances to the borders of the Nyae Nyae area. Because of this factor, the "Tsi bean" is not popular in the Dobe area, where the alternative primary food, Ricinodendron, is locally abundant.

[312] The last of these eight major species is, in a sense, the most important, not because of its abundance or its food value (it is neither plentiful nor nutritious) but because of its water storage properties. This is the plant, Fockea monroi, the root of which may contain up to a pint of water. At the end of the dry season when food has become exhausted within a walking radius of the permanent waterholes, people often move into the waterless bush where food is still plentiful. Here they are able to live for one or two weeks by digging out and drinking the juice of the Fockea roots.

It may be useful to think of Ricinodendron and Fockea as the "alpha" and "omega" of the Bushman food plants. The first, Ricinodendron, is the food that carries the Bushmen through the months and years, while the second, Fockea, is the critical plant that enables the Bushmen to eat well through

the short but severe dry hot season.

824
262

III. Minor foods - Next in importance to these nine species is a series of 14 species which rate high on one or two of the criteria of desirability. These include seven species of edible roots and bulbs (including Coccinia spp., Eulophia spp., Lapeirousia spp., Vigna spp., and Walleria spp.) which taken individually are not important but as a class they become a major item of diet during the winter dry season. This is the time of year when the more abundant summer fruits and melons are not available. The winter foods include as well the edible gum from the trees Terminalia sericea and Acacia mellifera.

Five of these minor foods occur only during the summer. These include the berries of three species of the genus Grewia, and the edible leaves of the species Dipcadi glaucum and Talinum crispatulatum.

All of the species of Class III are seasonally limited. When available, each species was eaten several times a week. On this basis they can be distinguished from the major foods of Classes I and II which were eaten daily.

IV. Supplementary foods - There were 32 species of plants which were supplementary to foods of Classes I, II, and III, or which were eaten when the more desirable foods had become locally exhausted. The list comprises ten species

16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

824
262 of fruits and berries (including five species of Grewia), two species of melon, one species of leafy green, ten species of edible gum, and nine species of roots. The roots taken as a class were especially important during the winter season when the fruits and berries were not available. In general, the foods of Class IV were both less abundant and less tasty than the corresponding foods of Class III.

V. Rare foods - This class of foods includes 13 species which were observed to be eaten only on a few occasions. Nevertheless, several of these were classified as important foods by the Bushmen. For instance, the fruit of Guibourtia coleosperma was considered excellent eating, but this tree bears fruit only once in several years. Had the study been carried out during a year when Guibourtia was in fruit, it might have ranked higher. Maguire (n.d.), who did botanical research near Dobe in 1952-53, has listed Guibourtia as a major food.

Most of the foods in Class V were locally uncommon. These include two species of fruit, eight species of root, and the curious parasitic plant Hydnora sp. which bears an underground fruit (Story 1958:19-20).

VI. Problematic foods - Finally there are seventeen species which the Bushmen said were edible but which were not observed to be eaten during the study period. Some of these

824
262 such as Boscia albitrunca and Bauhinia macrantha did not come into fruit in 1963-64 because of the drought. The majority were not eaten because of their unattractive taste and because more desirable foods were available.

These 85 species are listed alphabetically by class in Table 5, pp. 108-110.

The way in which the Bushmen arrange these 85 plants in order of their importance as foods suggests a productive analogy to the way they utilize space in subsistence activities.

262
222 The Bushmen typically occupy a camp for a period of weeks and eat their way out of it. For instance, at a camp in the mongongo forest, the members of the camp will exhaust the nuts within a one-mile radius the first week of occupation, within a two-mile radius the second week, and within a three-mile radius the third week. The longer a group lives at a camp, the farther they must travel each day to get food. This is a feature of daily subsistence that occurs at both winter and summer camps. For instance, at the Dobe winter camp, in June the gatherers were making daily round trips of six to nine miles to reach the mongongo nuts. By August the daily round trips had increased to twelve miles.

This progressive increase in walking distance occurs because the Bushmen are highly selective in their food habits. They do not eat out all the food in a given area. They start

(TEXT CONTINUED ON PAGE 111)

16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

TABLE 5

• 824
262

THE 85 SPECIES OF BUSHMAN FOODS ARRANGED, BY CLASSES, IN ORDER OF DECREASING DESIRABILITY

Class I.	**Primary Food**	
1.	Ricinodendron rautanenii	(fruit and nut)
Class II.	**Major Foods**	
2.	Adansonia digitata	(fruit)
3.	Bauhinia esculenta	(beans and root)
4.	Citrullus lanatus	(melon)
5.	Fockea monroi	(root)
6.	Grewia flava	(berry)
7.	Hyphaene ventricosa	(fruit and stalk)
8.	Sclerocarya caffra	(fruit and nut)
9.	Ximenia caffra	(fruit)
Class III.	**Minor Foods**	
10.	Acacia mellifera	(gum)
11.	Coccinia rehmannii	(root)
12.	Coccinia sp. (or Trochomeria sp.)	(root)
13.	Diospyros chamaethamnus	(fruit)
14.	Dipcadi glaucum	(leaves)
15.	Eulophia sp.	(root)
16.	Eulophia sp.	(root)
17.	Grewia bicolor	(berry)
18.	Grewia flavescens	(berry)
19.	Lapeirousia coerulea	(bulb)
20.	Talinum crispatulatum	(leaves)
21.	Terminalia serdbesa	(gum)
22.	Vigna dinteri	(root)
23.	Walleria muricata	(bulb)
Class IV.	**Supplementary Foods**	
24.	Acacia erubescens (var. A. dulcis)	(gum)
25.	A. fleckii	(gum)
26.	A. gillettiae (var. A. uncinata)	(gum)
27.	A. giraffae	(gum)
28.	A. heteracantha	(gum)
29.	Annona stenophylla	(fruit)
30.	Burkea africana	(gum)
31.	Ceropegia sp. nr. C. leucotaenia	(bulb)
32.	C. sp. nr. C. mozambicensis	(bulb)
33.	Citrullus naudinianus	(melon)
34.	Coccinia sessilifolia	(melon and root)
35.	C. sp.	(root)

824
262

36.	Combretum imberbe	(gum)
37.	C. mechowianum	(gum)
38.	Cyperus fulgens	(bulb)
39.	C. sp.	(bulb)
40.	Dichrostachys glomerata	(gum)
41.	Dipcadi longifolia	(bulb)
42.	D. sp.	(bulb)
43.	Grewia avellana	(berry)
44.	G. falcistipulata	(berry)
45.	G. retinervis	(berry)
46.	G. subspathulata	(berry)
47.	G. sp.	(berry)
48.	Mukia maderaspatana	(leaves)
49.	Raphionacme sp.	(root)
50.	R. sp.	(root)
51.	Strychnos spinosa	(fruit)
52.	Terminalia prunioides	(gum)
53.	Vangueria longicalyx	(fruit)
54.	V. infausta	(fruit)
55.	Ximenia americana	(fruit)

Class V. Rare Foods

56.	Corallocarpus welwitschii	(root)
57.	Cucumis sp.	(root)
58.	Guibourtia coleosperma	(berry)
59.	Hydnora sp.	(root)
60.	Ipomoea verbascoidea	(root)
61.	Lapeirousia sp.	(bulb)
62.	Nymphaea sp.	(root)
63.	Ochna pulchra	(berry)
64.	Raphionacme burkei	(root)
65.	R. sp.	(root)
66.	Salacia lubberti	(fruit)
67.	Strychnos pungens	(fruit)
68.	Vigna unguiciculata	(root)

Class VI. Problematic Foods

69.	Acacia karoo	(gum)
70.	Amaranthus sp.	(leaves)
71.	Aristida gracilior	(seeds)
72.	Bauhinia macrantha	(beans)
73.	Boscia albitrunca	(fruit)
74.	Cephalocroton pueschellii	(fruit)
75.	Clerodendrum uncinatum	(fruit)
76.	Combretum psidioides	(gum)
77.	C. zeyheri	(gum)
78.	Dichapetalum cymosum	(fruit)
79.	Dichrostachys cinerea	(gum)
80.	Dipcadi longifolium	(bulb)
81.		

824
262
[192]

81.	Grewia sp.	(berry)
82.	Ziziphus mucronata	(berry)
83.	not determined - !Kung name -"todi"	(root)
84.	not determined - !Kung name -"!:gwi"	(root)
85.	not determined - !Kung name -"//aiżeri"	(root)

222
262
[825] species of beetles were observed to be eaten. Termites and locusts were not eaten. Honey is highly regarded as food by the Bushmen, and the hunters often investigated bees nests but honey was never observed to be eaten at the Dobe camp and only rarely at other camps.

262
824
825 In summary the plant and animal resources of the Dobe area include 85 plant and 54 animal species which are eaten. Closer examination reveals that only a small number of these edible species play a major role in the diet. Only 26 of the 139 edible species may be considered as major Bushman foods: 9 species of plants and 17 species of animals.

16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

361 Each of the groups moves in a "direction" from its waterhole.
312 For instance, the Dobe people move to the west and north, the !angwa people move to the northwest, and the !gose people move to the east.

361 The concept of territoriality as applied to the Bushmen differs from the concept used by zoologists in discussing the spatial arrangements of animals. The zoological usage refers to the exclusive use of space, by an organism or group of organisms who defend this space against competing members of the same species (Bourlière 1964:94-100).

By contrast the Bushmen groups do not defend boundaries and members of all groups travel freely between camps. However, land utilization is not at all a random phenomenon.
[222] The Bushmen population is organized into land-holding units,
[224] and the members of a unit tend to spend the greater part of the year hunting and gathering within a specific area.

Thus, in the context of this study, the term "territory" refers to the area within which an independent camp moves during the annual subsistence cycle.

361 The locations and spatial configurations of territories
• 824 are determined by the distribution of water and food resources.
[312] Each territory has within it a permanent waterhole, one or more seasonal water sources, and one or more mongongo nut forests. Every territory includes, in addition, a selection

361
824 of summer foods such as the berries of Grewia spp. and melons of the Citrullus vines, and a selection of winter foods such as roots of the genera Vigna and Coccinia, and edible gums from the genera Acacia, Terminalia, and Burkea.

361
824 No two territories have the same constellation of plant foods and no single territory provides the complete inventory of 85 species of plant foods. The Bushmen are well aware of the variations in plant resources between the several territories and there is general agreement on the "strong" and "weak" points of each territory. For instance, !ubi is famous for its Baobab fruits (Adansonia digitata), a food which most other territories lack. /ai/ai is known for the abundance of its wild orange trees (Strychnos spp.) but is considered "weak" in vegetable ivory palms (Hyphaene ventricosa) which are rare south of the Aha Hills. Dobe, on the other hand, is said to be "strong" in vegetable ivory palms and "weak" in the wild orange trees. Bate is famous for its groves of trees bearing the morula nut (Sclerocarya caffra) but is "weak" in trees bearing the mongongo nut
[132] (Ricinodendron rautanenii). Furthermore, local variations in seasonal rainfall may produce an abundance of food in one territory and leave another territory with a food scarcity.

361
433 The important point is that every territory has enough food to sustain at least some of its members throughout the

311 area of each territory.

[312] Second, the area and shape of an individual territory is
[824] influenced by the distance between the important resources within it, such as water sources and mongongo nut forests. It is these point resources and not the spaces between them that are the significant features of the landscape.

Third, territories overlap each other and there is disagreement as to the ownership of these overlapping areas. Most Bushmen say that these areas are owned by all, which means, in effect, that they are owned by no one.

Each of these features will be discussed in detail.

1. Hinterland - It was mentioned earlier that the Dobe area
[312] was surrounded by a belt of uninhabited country. Except for a few summer months there is no standing water in this belt and, as a consequence, the Dobe area people rarely bother to hunt and gather within it. This outer belt is not lacking
[136] in food resources, however. Surveys of the country by Land-
[137] Rover indicate that the game and plant foods there are even more abundant than they are within the traditional territories. Why then are these resources so infrequently utilized?

311 The answer lies in the fact that the Bushmen can usually
312 satisfy their annual subsistence requirements within a radius
361 of 15-20 miles from their permanent waterholes. Whenever possible the Bushmen prefer to make their camp sites at

311 beyond the area enclosed by the dotted line, and this line
361 therefore accurately represents the total utilizable space of the Dobe area.

311 2. Point resources - In Map 15, the picture of land utili-
312 zation was simplified by omitting the actual patterning of
361 food resources. In fact, the extent and configuration of
• 824 the intensively utilized areas is influenced by the location of the mongongo nut forests and the distance of these forests from the permanent waterholes. These resources are plotted in Map 16. For instance, in an area where the mongongo nuts within a walking radius of water are sufficient to support a camp throughout the year, a group's territory will be small. However, in an area where the mongongo nuts are less locally abundant, the territory must, of necessity, be much larger.

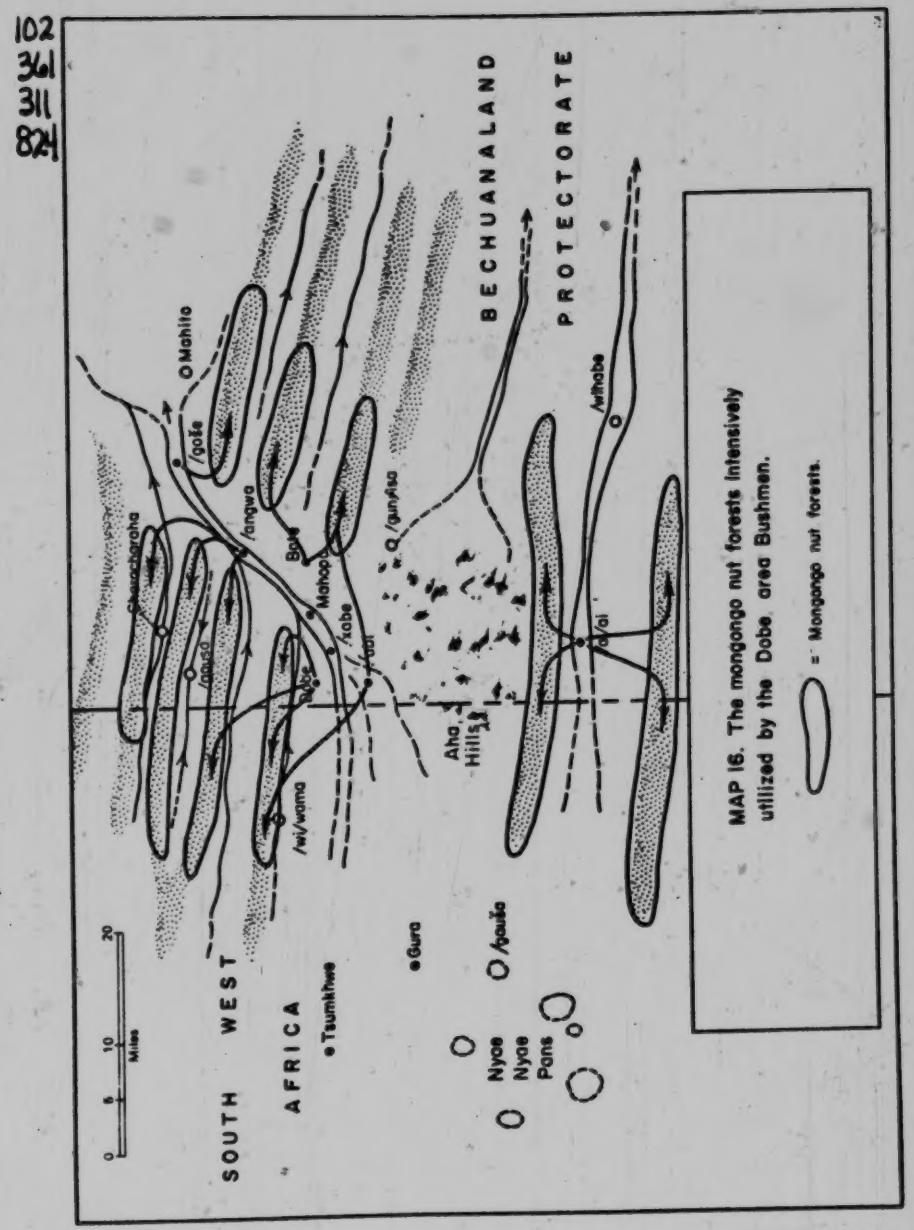
The people of !goše, for example, are fortunate in having a vast nut forest within a ten mile radius of their waterhole.
[162] The nuts from this forest are abundant enough to support the 62 members of the !gose camp throughout the year. By contrast, the nut forests near Dobe are much less abundant than at !goše.
[162] The 36 members of the Dobe camps have to walk farther (up to 18 miles at the end of the dry season) in order to collect the mongongo nuts. As a result, the effective annual territory of the Dobe people is larger than that of the !goše people, despite the fact that the population of Dobe is smaller than

[TEXT CONTINUED ON PAGE 147]

16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

146

102
361
311
• 824



16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

VIII. WATER AND THE SEASONAL ROUND

138
137 The Kalahari desert is not a food poor area. Most of it is situated between the 10 and 20 inch isohyet and therefore it is marginal for cultivation (without irrigation), but the desert supports a remarkable abundance and variety of edible wild plants which have become genetically adapted to arid conditions.

Geographers have classified the Kalahari as "desert" because of the lack of surface water (Wellington 1955 etc.). This in turn is a function of the sandy terrain which supports surface water only during a brief summer season. In the few localities where the underlying geological formations are exposed, permanent standing water is found. And these point sources of water are usually surrounded by waterless belts of

312
• 824
433
221 up to 200 miles in width. Edible plants on the other hand are widely distributed both in the immediate vicinity of water and at considerable distances from it. The geographical separation of food and water in certain seasons is the critical problem of !Kung Bushman subsistence.

This is not a major problem during the rainy season when seasonal standing water may be found in close proximity to the concentrated food resources. Nor is this a major problem during the early winter when food is available around the

312
221
433
824 permanent water sources. Nevertheless for one season every year Bushmen must face a situation in which major foods and permanent water are a considerable distance apart. How Bushmen arrange their lives to meet this situation will be illustrated by data from the Dobe area !Kung Bushmen.

312
824
222 According to the Bushmen, water has always existed in the eight permanent waterholes of the Dobe area. Seven of these waterholes are situated in or near the dry bed of one molapo, the !angwadum. The eighth, 25 miles to the south, is in the bed of another molapo, the /ai/aidum. These molapos lie in the center of a belt of flatlands which varies in width from 5-10 miles. It was pointed out in Chapter IV that the molapos interrupt the basic system of parallel dunes that cover most of the northwestern Kalahari. But it is only on these dunes that the primary Bushman food, the mongongo nut, is found. The result is that each of the eight waterholes is three to seven miles distant from the nearest grove of mongongo nuts. Thus gatherers who are camped at a permanent water must make a minimum daily round trip of six to fourteen miles in order to gather mongongo nuts. As the nearest nuts become exhausted the round trip distance becomes greater and greater, until it reaches a distance that is too far to walk in a day. This distance varies from camp to camp but 12 miles (6 miles out and 6 miles returning) was close to the maximum that the

312
824 people were willing to walk in a single day for the purpose
222 of food gathering. In order to exploit food resources further than seven miles from water, the Bushmen feel that it is necessary to make a temporary camp at the food and stay overnight.

312
222 The options available to Bushmen facing such a situation are three: 1) they may carry water to the food and live there until their water is exhausted; 2) they may move to the food and dig water-rich roots to satisfy their moisture requirements; or 3) they may wait until rainfall produces standing water nearer the desirable foods.

312
147 There are no physiological short cuts to solving the water problem. There is no evidence that the Bushmen's daily water requirements are less than that of other peoples (Wyndham in press; Silberbauer 1965). Like all peoples, the Bushmen must drink water to live and their daily requirements are a function of such factors as ambient air temperature, wind velocity and the work they have to do[1] (Ladell 1958; Adolph et al. 1947).

---

[1]Ladell, a physiologist specializing in problems of human life in arid regions has said: "It can be categorically stated that no man of any race, however acclimatized and trained, can survive in a hot desert climate without very liberal supplies of water; there is, and can be, no substitute for water and there is no remedy for its deficiency". (1958:85).

312
221 The availability of water can be regarded as the most important determinant of Bushman subsistence activities. A season by season account of these activities will serve to illustrate how subsistence strategies take maximum advantage of water sources. The annual subsistence cycle is described under six headings:

1. First rains
2. Main rains
3. Autumn
4. Early winter
5. Later winter
6. Spring

1. <u>First rains</u>

The onset of the first rains finds the Bushmen clustered [361] around their permanent waterholes. It is this time of year [574] that camp membership is most stable because all areas are short of food and there are fewer incentives for visiting [132] other camps. Also the weather is hot with mean daily maxima of 100°F and walking is uncomfortable.

312 Food, in the vicinity of permanent water, is in short
221 supply. Fruits, berries, melons and leafy greens, which appear
824 only during the main rains, are nowhere available. The mongongo nuts are still abundant but are found only at distances of ten or more miles from the permanent waterholes. The diet

312 at the waterholes consists primarily of roots and bulbs of the
221
824 genera: Eulophia, Vigna, Walleria, and Coccinia, and the edible sap of Acacia spp. and Terminalia sericea. It is this time of year that the heart of the dwarf vegetable ivory palm is eaten, [164] (Hyphaene). Those who eat its fibrous pulp experience stomach cramps and diarrhea, but, as the Bushmen say, it make one's "mouth work" and gives one a sensation of a full stomach.

221 Hunting is arduous business in the heat and men who go out in
224 the early morning find it necessary to spend the mid-day hours resting in the shade. The principal animal killed is the springhare.

132 The first rains are convectional thundershowers. Their distribution is spotty. A storm may briefly inundate one area and miss entirely another area only a mile away.

312 The Bushmen observe the storm clouds travelling across
222 the horizon and try to judge where the showers have drenched
[821] the ground. They then set out in family groups in the direction of the rains. If they find that water has collected in the hollows of mongongo trees, they will stay in the nut groves for several days and eat nuts until the water is exhausted. They then fill their karosses with nuts and return to the permanent water. If, on reaching the nut groves, they find that no water has collected they will be forced to fill their karosses with nuts and return to camp the same day. In certain areas

824 222 Citrullus lanatus - the well-known "tsamma" melon was one of the superabundant foods. It was intensively exploited throughout the mid-summer until it was exhausted within a radius of five miles of the !Gausa Pan. This is a remarkably successful plant around the areas of human habitation. It is an annual (Story 1964:20) and will sprout from seed wherever the pips have been discarded. It is interesting that the Bushmen do not consider cultivating this melon, a common practice among the neighboring Bantu.

Grewia flava berries were superabundant in the vicinity of !Gausa and Characharaha. The amount a woman could bring home was limited only by the speed at which she could pick them from the five-foot tall bushes. In addition, six other species of Grewia were locally available: (G. bicolor, G. flavescens, G. avellana, G. falcistipulata, G. retinervis, and G. subspathulata). It is interesting that, because G. flava has the tastiest berry of all the Grewias, the other six species were largely ignored until the G. flava had been exhausted within a six mile radius of !Gausa.

824 262 When the new crop of mongongo nuts falls, the gatherers can ignore the ~~previous years~~ crop. The mongongo nut has two edible portions: an outer fruit and an inner kernel. Figure 3 on page 161 shows a mongongo nut in cross section magnified four times to show detail. The outer layer of skin

[TEXT CONTINUED ON PAGE 162]

824

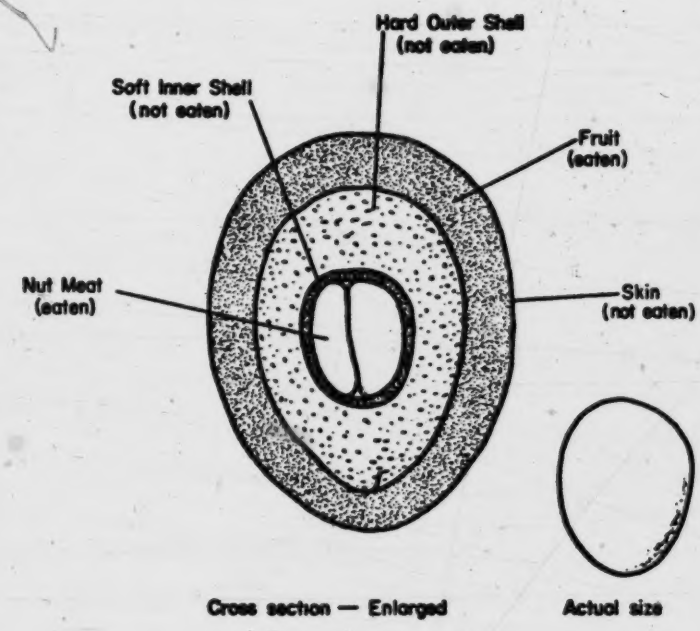


FIGURE 3.
MONGONGO NUT (Ricinodendron rautanenii)

824 is not eaten. Next is a casing of granular-textured fruit
262 which is eaten. The fruit encloses the nut itself. This consists of a thick outer shell which must be cracked open with the nut-cracking stones. Within the thick shell is a softer inner shell which encloses the nut kernel which is the staple of the Bushman diet. This inner kernel is "packaged" within four protective layers and this explains its remarkable storage properties.

824 In the late summer and autumn months the Bushmen eat
252 large quantities of both the fruit and the nut. First the women boil potfuls of whole fruit in order to separate the outer flesh from the hard shell. The flesh of the fruit produces a delicious fruit puree that tastes like stewed prunes. After the fruit is eaten, the nuts themselves are set aside for later cracking and eating.

184 The summer hunting situation appears to vary from camp
221 to camp. At the !Gausa camp very little hunting was done.
224 The resident men assisted the Bantu in cattle herding and they
[177] received calabashes of sour milk as payment. At Characharaha
648 the men hunted more, killing gemsbok, python and porcupine.
[464] At one summer camp, Mokoro, where there were no Bantu resident, two young men killed four large buck in the space of one month (two kudu and two gemsbok). This Mokoro camp was an
[177] unusually successful one. The availability of cows' milk and meat no doubt lessens the men's incentive for hunting

221 of winter from May to mid-July is a period of relative abun-
312
433 dance. This is due to the fact that the permanent waters
[361] have not been occupied during the summer months, and there is abundant food in their vicinity when the Bushmen return to
[824] them in May. Subsistence has a double base, including both the tail-end of the summer foods such as the Grewia berries, and the first series of winter roots and bulbs. Mongongo nuts are also locally available. The distribution of the Bushmen population during the winter of 1964 is shown in Map 19, p. 165.

221 The root foods are generally associated with the winter
824 subsistence. This is curious because as perennials the bulbs may be dug out at any time of the year. But the Bushmen do not concentrate on root foods during the summer months: they pass them over in favor of the foods of shorter duration, the fruits and melons. They state that they do not like the flavor of the root foods during the winter.

In May and June these root plants are exploited and the pressure on them increases through the winter as the nuts become locally exhausted. The major roots are Eulophia spp., Vigna dinteri, Walleria muricata, Coccinia spp., Coccinia rehmannii and Ceropegia spp. - nine species in all. These have edible bulbs or storage organs which range in size from one to three inches in diameter.

[TEXT CONTINUED ON PAGE 166]

221
222 well into September. On the other hand, at /ai/ai, where 109
184 Bushmen were living, the local mongongo nuts were exhausted at the beginning of July.

Since each territory was known for a different selection of winter foods, the transition took a different form at each waterhole. At Dobe, the mongongo nuts were replaced as the staple of the diet by Baobab fruits (Adansonia) and vegetable ivory palm hearts (Hyphaene). At Bate the people shifted from mongongo nuts to Sclerocarya caffra nuts. At !angwa, the people concentrated on collecting Acacia spp. gums.

221 In general the diet of the Bushmen becomes much more
824 eclectic during the latter half of the winter. It was during
146 this season that the Bushmen took advantage of a wide selection of edible species. Instead of eating mongongo nuts with a few other species as "side dishes", the people had to diversify their diet in order to live well. During August and September no less than 25 species of roots, bulbs and edible gums formed the basis of the diet.

222 There was an alternative strategy to eating less desirable
312 foods. If a family was prepared to make the effort required to reach the nutting groves, they would fill their water containers (ostrich egg shells and the stomachs of antelope) and walk to the nuts. They would collect and eat there until

251 were roasted in the coals of the fire and then pounded to
252 the consistency of coarse meal in the wooden mortar. This
262 roasted hide had the taste and texture of crisp crackling and was delicious when pounded and mixed with the flesh of roots of the genera Coccinia, Walleria and Eulophia. These stores of dried hide and meat did not serve as a staple surplus so much as an emergency delicacy to brighten the diet when a day's hunting had been unsuccessful.

221 The major food strategy during the hot dry spring was
222 the 7-14 day trip to the waterless country where mongongo nuts
312
361 were still plentiful. At these camps the only source of
824 water was the juice from the roots of Fockea monroi. Fockea has an uneven distribution in the Dobe area. The Bushmen must camp in a nut forest that is in close proximity to patches of Fockea. The maximum period that a group was observed to live on Fockea roots was two weeks. The limitation is set by the density of Fockea plants in an area, and the amount of fluid that each plant holds. Life at the Fockea patches is difficult because people have to work hard to obtain water as well as food. Each Fockea root storage organ contains 8-16 ounces of recoverable moisture. Thus a daily ration of 72 ounces of water can be obtained by digging out 5-10 Fockea roots.

312 But the dilemma of living on Fockea lies in the fact that
824
222

16: Lee E-5 (1963-1965) 1966 FX10 Bushmen FX10
!Kung

312
824
222 a great deal of energy must be expended in digging out these roots, and the concomitant of this expenditure of energy is a much greater fluid loss through sweating.

It was mentioned earlier that the body's daily water loss is in part a function of the intensity of activity. For instance, an individual who is resting in the shade will lose half the water that is lost by another individual who is walking in the sun.[1] When standing water is available, the amount of energy expended in obtaining water is small. An individual walks a few hundred yards from his camp to the waterhole, drinks his fill there, then fills his water containers and walks back to the shade of his camp. On the other hand, an individual who is living on Fockea roots must walk several miles per day in the sun and must dig out a number of large roots that are buried 12-18 inches deep in the hard soil of the molapos. Therefore an individual who drinks Fockea juice must first replace the considerable quantity of water that is lost through the effort of searching and digging the Fockea roots; this is in addition to the water that is lost in the course of normal daily activities such as hunting, food gathering and resting.

---

[1] Adolph and associates (1947) present detailed analyses of this and other factors in sweat production.

312
824
222 The net effect of this effort is that an individual must drink much more than the minimum daily requirement of 72 ounces of water. In fact, men who were living on Fockea roots, were observed to dig out between 15 and 20 of the roots per day. The quantity of water provided by these roots is estimated at 150-300 ounces, part of which went to provide water for the children of the camp.

222
484
312 A description of one Fockea trip, in which the author participated, will serve to illustrate some of the difficulties of living away from standing water.

[123] This trip began on 6 November and ended on 16 November, 1964. The group consisted of 12 Bushmen (plus the author); there were three men, four women, and five children. One of the young women gave birth during her stay so the returning group consisted of 13 Bushmen.

November 6 - This group (minus one of the men who came out the following day) set out from the Dobe waterhole at 10:00 [103] a.m. They spent the day walking to a nut forest named !wi/wama which was situated eleven miles west of Dobe. The original plan was to remain there for five days.

[481] The pace was leisurely to suit the three older children [855] (ages 12, 8, 6 respectively) who went on foot and the young [843] woman who was in the terminal month of her pregnancy. On the way we stopped at intervals to eat seven different species of

222
484 location closer to the nuts. By 7:00 a.m. this camp had been
312 deserted. The women and their children had gone to collect
[462] nuts and the men had set out to find Fockea roots and to hunt
[224] along the way. The men carried no water with them on the hunt. The author accompanied the men.

We walked south for several miles looking for fresh animal tracks and for patches of Fockea plants. We passed through two molapos where the Fockea plants were likely to exist, but to our disappointment we found none. It was 10:00 a.m. before we dug out the first Fockea of the day.
[132] By this time the morning coolness had disappeared and we had to walk and dig in the sun with shade temperatures about
312 100°F. The first Fockea worth digging were found 4-1/2 miles
824 south of our camp at !wi/wama. The roots were the size of a football and weighed about three pounds.

The flesh of Fockea is white and juicy with a spongy granular texture. The juice is milky in color and slightly astringent so that it smarts when accidentally rubbed into small cuts on the hands. There are two methods of extracting the moisture from the root. First, one cuts open the root with a knife and chops off chunks of the flesh inside. This may be eaten directly like watermelon. The disadvantage of this method is that one must swallow about three pounds of roughage in order to extract one pint of moisture; in other

312
824 words, 15 lbs. of roughage per day for the minimum water requirment. This is the most efficient means of processing water from Fockea roots because the digestive system can convert all the moisture that is in the Fockea flesh.

However, the Bushmen say (and I can corroborate this) that a man cannot swallow 15 pounds of pulp per day. The stomach becomes full long before one's thirst is quenched. It is probable also that such a great quantity of roughage would put an intolerable burden on the human digestive system, even of people whose digestive systems are accustomed to processing quantities of fibrous roughage.

The more common way of extracting moisture from the root is to squeeze the juice out by hand. The juice may be squeezed directly into the mouth, or squeezed into a cup and then drunk. This is a less efficient way of extracting moisture because much of the juice remains in the fibers after squeezing. Also some of the juice runs down the arms. It does offer a distinct psychological advantage, however, because one is able to drink the juice and thus satisfy the swallowing reflex which is connected with the neurophysiological sensation of thirst (Ladell 1958). Eating the flesh of Fockea does not satisfy this sensation.

484
224 The men continued to eat and drink Fockea from 10:00 a.m. to 12:20 p.m. Then we started to hunt in a northerly direction.
[312]
[824]

433
• 824

Abundance of Resources -- The habitat of the Dobe area !Kung Bushmen is rich in naturally-occurring foods. The three distinct plant associations - of the Dune, the Flats, and the Molapo - each support a distinctive constellation of food plants. By far the most important of these is the Dune association and its main constituent, the mongongo tree. From the vast groves of this tree, many thousands of nuts are harvested each year. The mongongo nut, because of its abundance and reliability, resembles a cultivated staple crop such as maize or rice. In terms of nutritional value - proteins and sugars - it even exceeds the cereal crops. Furthermore, it is drought-resistant so that the mongongo nut will still be abund-
[221] ant in dry years when cultivated crops fail. The excellent storage properties of the nut allow it to be harvested in all months of the year. This factor is especially important during the dry winter months when the short-term rainy season foods are not available. It is not surprising, therefore, that when the Bushmen are asked to explain why they have not taken to cultivation, they reply: "Why should we plant when there are so many mongongo nuts in the world?"

Variety of Resources -- The mongongo nut is only one, albeit the most important, of the 85 species of edible plants available to the Bushmen. The existence of this variety of foodstuffs

433
824 allows for a wide range of alternatives in subsistence
433 strategy. During the summer months the Bushmen have no prob-
824 lem other than to choose among the tastiest and most easily
221 collected foods; other species which are quite edible but less attractive are simply bypassed, so that gathering never exhausts all the available foods of an area.

During the dry season, when the fruits and melons have gone, the gatherers still have multiple options open to them. They may plan a hike to the molapos to collect the edible Acacia gums, or they may go to the flats to dig out roots and bulbs. Even at the end of the dry season, when the stronger members of a group are making the long hikes to the mongongo forests, the older, less mobile members can derive an adequate subsistence from an eclectic diet of minor foods which are closer to home.

433 Plants versus Game -- The security of Bushman subsistence
222 derives in part from the fact that meat is of secondary import-
224 ance to vegetables in the diet. The !Kung males are persistent, but not particularly successful hunters. Although hunting accounts for over half of the subsistence effort of a camp, meat comprises only 20-40 per cent of the diet. The basis of the Bushman diet is plant food, and meat has come to be regarded as a special treat. When meat is available, it is welcomed as a break from the routine of vegetable foods, but it is never

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot
Bushmen FX10

exchanged from hut to hut, the women going to one hut, the men to another, and so on. Only the owners sit in a hut, while the visitors gather round the fire outside. The little children play about everywhere, the bigger boys and girls by themselves. There is no fixed time for going to sleep. As a rule the people turn in to bed fairly early, but if it is a fine evening dancing may be started and kept up till late, everybody taking part except the old people and the little children.[1]

Food and Fire

The Bushmen will eat almost anything that can be eaten. Of animal foods the favourite is game of all kinds, when it can be obtained, and they are also very fond of hare, spring hare, guinea fowl, korhaan, partridge, ostrich, and other birds, as well as birds' eggs. Fish too are eaten wherever they can be caught, and among the Bushmen of the Okavango swamps are a staple article of diet. Anteaters, ant bears, tortoises, porcupines, bull frogs, snakes, and lizards are greatly relished, while among insects locusts, scorpions, beetles, young bees and honey, termites, flying ants and ants' eggs are also eaten. In fact all kinds of living animals are made use of as food, with the almost universal exception of the baboon and the hyena—the former " on account of its being so like a man ", the latter " because it eats human corpses ".

The most important vegetable foods in the Southern and Central Kalahari are the *tsama* (*Citrullus vulgaris*), " uintjies " (*Cyperus edulis Dtr.*), *Grewia* berries, and the *//noun* (*Bauhinea esculenta*); in the Namib the */naras* fruit (*Acanthosicyos horrida Welw.*) forms almost the sole article of diet when in season; while as one proceeds northwards various fruit-bearing trees appear, such as the wild fig, palm, omungete nut, wild orange, omuande, and omuve. In addition numerous other varieties of edible roots, berries, cucumbers, tubers, melons, and ground nuts appear in great profusion during and after the rainy season, when they form the principal part of the daily menu.[2]

Much of the food is eaten raw, but the Bushmen know how to prepare and cook it. Each family prepares its own food. Cooking

[1] Passarge, op. cit., 44 sqq.; D. F. Bleek, *The Naron*, 32; Fourie, " The Bushmen of S.W. Africa," 88.

[2] Stow, *Native Races of S. Africa*, 54 sqq.; von François, *Nama und Damara*, 234–5; Schultze, *Aus Namaland und Kalahari*, 659 sqq.; Passarge, op. cit., 44 sqq.; Kaufmann, " Die Auin," 139–40, 144 sqq.; Werner, " Ueber die Heikum- und Kungbuschleute," 253–5; Dornan, *Pygmies and Bushmen*, 114 sqq.; D. F. Bleek, op. cit., 6–7; Fourie, op. cit., 98 sq.

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot
Bushmen FX10

222 422 way private rights can be indicated over honey in a nest, or by a woman who has located a spot with a specially abundant supply of veldkos. Whoever removes anything from such places is regarded as a thief.[1] It must be emphasized, however, that rights of this nature are only [423] acquired by chance, and that apart from them there appears to be no restriction at all upon the free exploitation of the hunting territory and all its resources by any member of the band.

Hunting

224 [883] [462] Once they have passed through the puberty ceremonies, boys and girls participate in the full economic life of the band. All the men are hunters, and spend the greater part of their daily life in pursuing or ensnaring game. Their methods of hunting vary with the nature of the intended prey, and according to the season of the year.

Weapons

411 The principal method is by means of pursuit and the use of weapons. The latter amongst all the Bushmen consist primarily of the bow and arrow.[2] The bows are small, and on the whole fairly crude and of simple make (Plate IXd). They are as a rule prepared from the wood [824] of the *Grewia flava*, a thin length of which is cut and roughly shaped is such a way as to taper gradually almost to a point at the ends. The [283] string is made either from two thin sinews twisted together or some- [237] times, among the Northern tribes, from wood fibre worked into a [284] strong cord. It is attached by a simple slip-knot and wound tightly several times round the basal end of the bow-stave, to which a small leather collar or sinew band is usually fixed to prevent the string from slipping when hitched over it. The stave is then bent and the string knotted to the other end, where it is kept in place by a leather band. The bow is kept permanently strung. Its stave is frequently strengthened with additional sinew bindings, especially round the centre, which prevent it from splitting and also form a convenient grip for the hand.

The arrows are complex in structure and vary considerably in

[1] Hahn, "Die Buschmänner," 120; *idem*, in *Trans. S. Afr. Phil. Soc.*, ix (1896), p. xvii; Vialls, "The Masarwa," 32; Kaufmann, loc. cit.; D. F. Bleek, *Naron*, 36; Lebzelter, "Bei den !Kuñ-Buschleuten," 13.

[2] Schapera, "Bows and Arrows of the Bushmen," *Man*, xxvii (1927), 113–17; cf. Stow, *Native Races of S. Africa*, 68–71; Kaufmann, op. cit., 143–4; van Rippen, "Notes on Some Bushman Implements," 80–5; Gretschel, "Die Buschmannsammlung Hanneinann," 94–6, 99–100.

2: Schapera E-4, 5 (no date)1930
FX13 Hottentot
Bushmen FX10

finds expression in the numerous observances and beliefs developed in relation to the sources of water, and especially to the rain. Here, however, we may note how the Bushmen cope in practice with this ever-present problem.

Caches of ostrich egg-shells containing water are often buried in the ground or hidden in a tree for future use, and to steal them is one of the greatest offences in Bushmen life. When even these have given out, a substitute is found in various succulent plants, especially the */naras* and the *tsama*, which contain enough moisture to relieve thirst and which are still available for the first part of the dry season. In some parts of the Kalahari water may still be found below the surface at this time, and to obtain it the people make use of an ingenious filter. A hole is dug in the sand where the green colour of the grass indicates the presence of the subterranean water, and with a reed tube to the lower end of which is attached a bundle of grass they painfully suck out drop by drop the water that has collected below, then carefully transfer it to the egg-shell bottles. But when even this resource fails them, they are compelled to make hurried marches back to the permanent waterholes, to which they cling until the coming of the rainy season again enables them to move out into the sand veld and resume their normal hunting life.[1]

Industries and Trade

Industries

Besides their food, which they must find from day to day, the Bushmen have need of little but their weapons and utensils. Their household possessions are few, for they seldom own more than they can conveniently carry about with them, and all their industries are essentially domestic.[2]

From wood they make their huts, the staves of their bows and spears, quivers for their arrows, digging-, throwing-, and firesticks, the long barbed stick used for catching spring hares and other burrowing animals, the poison sticks on which the arrow poison is gathered in lumps after it has been prepared, the spits (sometimes

[1] Livingstone, *Missionary Travels*, 51; Chapman, *Travels in S. Africa*, ii, 297; Passarge, *Buschmänner*, 51, 70–1, and fig.; Schultze, *Aus Namaland und Kalahari*, 671–3; Seiner, "Bereisung der Omaheke," 293–4.

[2] The most comprehensive account of Bushman industries is to be found in Gretschel, "Die Buschmannsammlung Hannemann," *Jb. städt. Mus. Vkde. Leipzig*, v (1911–12), 89–113, pl. xxiii–xxix, which relates chiefly to the Auen; cf. also van Rippen, "Notes on Some Bushman Implements"; Stow, *Native Races of S. Africa*, 62–80; Passarge, op. cit., 81–94; Gentz, "Beiträge zur Kenntnis der südwestafrikanischen Völkerschaften," 297–301; Kaufmann-op. cit., 152–3; Schultze, op. cit., 658 sqq.; Werner, "Ueber die Heikum- und Kungbuschi leute," 257; D. F. Bleek, *Naron*, 8–18 *passim*; Fourie, "Bushmen of S.W.A.," 103.

322 decorated with burned lines) on which meat is roasted, and scoops
[412] for hoeing out the earth loosened with the digging-stick. The North-
[415] western tribes also manufacture wooden cooking pots (sometimes decorated with burned patterns of simple design), calabashes for holding fat and other liquids, eating vessels and spoons, as well as pestles and mortars, the latter often provided with a stone bottom,
[283] which are used for pounding up dried berries, etc. Wood fibre is twisted into cord, from which they prepare their snares and sometimes their bow-strings and make nets for carrying their belongings.

824 Reeds provide them with arrow-shafts and with the tubes for
285 sucking up water, as well as with the material from which they make
[412] their fish-traps and weave closely-stranded mats for sifting ants' eggs. Reed mats are also occasionally used in the building of their huts.

237 Ostrich egg-shells are converted into bottles for holding water,
[415] and are also broken up into very small pieces from which the women
[306] make their beads. Tortoise-shells are used as spoons and scoops, and are also made into powder boxes for containing *buchu*. Small
412 drills are made of stone for the manufacture of ostrich egg-shell
324 beads, larger ones for the manufacture of serpentine pipes; two or
[439] three stones are also used as anvils for working the iron obtained by
[326] barter, or for the purpose of grinding berries, and besides these a few smaller stones are to be seen used for hammer stones or rubbing stones.
178 The other types of stone implements, which link up the Bushmen with
324 the prehistoric cultures of South Africa, are now almost certainly no
[323] longer made; nor, too, are the crude pots of clay formerly used by the Cape Bushmen.

281 From the skins of animals killed in the chase, again, are made karosses, loin cloths, sandals, caps, leather bags, quivers, tobacco pouches, etc. The sinew is used for making bowstrings, for reinforcing the shafts of the bows and arrows, and as thread for sewing skins, while in some cases it also provides the string for the nets in which
321 personal belongings are carried. The long bones of the ostrich and various kinds of big game are used for making the foreshafts and points of arrows, while other bones are made into knives, awls, pipes, etc. Horns are manufactured into spoons, whistles, small quivers for carrying arrow-points during the rainy season, implements for
[237] stripping the fibre required for snares, artificial leeches, etc., while
[415] the stomach of large animals, when not required for food, is fashioned into bags for collecting the blood and for carrying water.

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot
Bushmen FX10

heads, beset the entire distance with all kinds of imaginary obstacles and difficulties; and even after all their labour on arriving at the desired destination they will have nothing but flies to live upon." This belief that after a time the dead arise and go to a land where there is an abundance of good food is likewise recorded by Campbell and by Miss Currle, neither of whom, however, is a specially trustworthy authority. The Bushman informants of Dr. Bleek also spoke of "the place to which the Bushmen go after death", but unfortunately the details given by them have not yet been published. We are unable, therefore, to tell if their ideas of a future life were in any way similar to those reported by Stow and the other writers.[1]

On the other hand, these Bushman informants also had a variety of interesting beliefs linking up death with the phenomena of Nature. The stars, they said, know the time when a Bushman dies, and the fall of one announces, to those who are not aware of it, that something bad has happened. When, after this, a "hammerkop" (*Scopus umbretta*, the "lightning bird" of other South African tribes) flies, calling out, over the camp, the people know that someone belonging to them has died. When rain is accompanied by lightning, girls who are out in the open become killed by the lightning and are converted into stars, while those who are taken away by the rain become beautiful water-flowers, which will not allow themselves to be plucked and disappear when approached. Such flowers must be let alone. Hence the rule that young unmarried women and girls must hide themselves from the rain. The Moon, again, is hollow (in its first quarter) because it is carrying people who are dead. The human heart is believed to fall down after death in the form of a shooting star; the hair of a dead person is changed into clouds, while his gall appears again as a green colour in the sky, and so forth. Dead people may also come in their own forms as apparitions to their relatives and friends, even in waking life. There seems, however, to be no evil portent in this; nor, indeed, does there seem to be any noticeable fear of dead persons on the whole, although we are told that the names of those who are dead must not be uttered by children at night.[2]

The Namib Bushmen, on the other hand, seem to fear dead people greatly, and, as we have seen, the thickened *dawes* sap placed in the

[1] Stow, op. cit., 129; Campbell, *Second Journey in S. Africa*, i, 29; Currle, "Bushmen of Namaqualand," 117; Bleek, *Bushman Texts*, 19.
[2] Lloyd, *Bushman Material Collected*, 21, 25; Bleek and Lloyd, op. cit., 365–71, 389–401.

2: Schapera E-4, 5 (no date)1930
FX13 Hottentot
Bushmen FX10

Treatment

is administered by relatives or friends, or in cases of acute and prolonged illness by a magician well versed in medical practices, who is paid for his services. In cases of the latter kind a very common method employed is massage, leading up to the extraction of foreign bodies (" disease-poisons ", " spirits of disease ", etc.) believed to have been introduced into the patient and thus causing his illness. When the " doctor " feels that the foreign body has been brought near enough to the surface by his treatment, he sucks the part affected and then, with a retching sound, triumphantly spits out the object he is supposed to have sucked from the patient's body. Stones, pieces of bark, small bones, etc., are thus extracted from the affected part of the patient, who in consequence is cured![1] Lebzelter records also that, while the " doctor " is busy performing this cure, the relatives and friends standing round pray to the " supreme being " to make the patient well again; and, as we have seen, the use of prayers in case of severe illness is mentioned by several other writers as well.[2]

More practical forms of treatment are also found, however.[3] Herbs and roots of various kinds are extensively employed as medicines. Sometimes they are burned to ashes which are then rubbed into small cuts made in the patient's body, sometimes they are boiled and given as a decoction. How far they actually do have curative effects is difficult to say, as no special study appears to have been made of their pharmacological properties, nor, save in a few instances, have they even been identified. But Dornan mentions that " for blackwater they use a plant called qilika (*Anacoampseros rhodesica*) by the Matabele; dysentery *Monsonia ovata*, and *Euclea lanceolata*; for various other diseases, *Cannabis sativa*, *Solanum nigrum*, *Lippia asperifolia* (malaria), *Cratalaria burkeana*, *Pterocarpus angolensis*, *Datura stramonium*, *Indigofera senegalensis*, and *Bauhinea reticulata*".[4] Burns, open sores, headaches, etc., are treated by rubbing medicated ointments on the part affected. Chapman describes another method of treatment undergone by himself. " Having a frightful headache from the heat of the sun, I resort to my usual Bushman remedy, at the expense of having my forehead ornamented with blisters dotted all over it the next morning. April [his Bushman guide] has a root

[1] A good eyewitness account of this treatment is given by Schinz, *Deutsch-Südwest-Afrika*, 340–1; cf. also D. F. Bleek, *Naron*, 29.
[2] " Religiösen Vorstellungen usw.," 411; cf. pp. 183 sq. above.
[3] Nolte, " Krankheiten und Heilmittel der Nama und Buschmänner," *D. Kol-Ztg.*, 1886, p. 629 sq.; Chapman, *Travels in S. Africa*, i, 159, 282–3; ii, 74, 182; Kaufmann, loc. cit.; Dornan, loc. cit.; Vedder, " Grammatik der !Kō-Buschmannsprache," 8–9; Fourie, loc. cit.
[4] Op. cit., 142.